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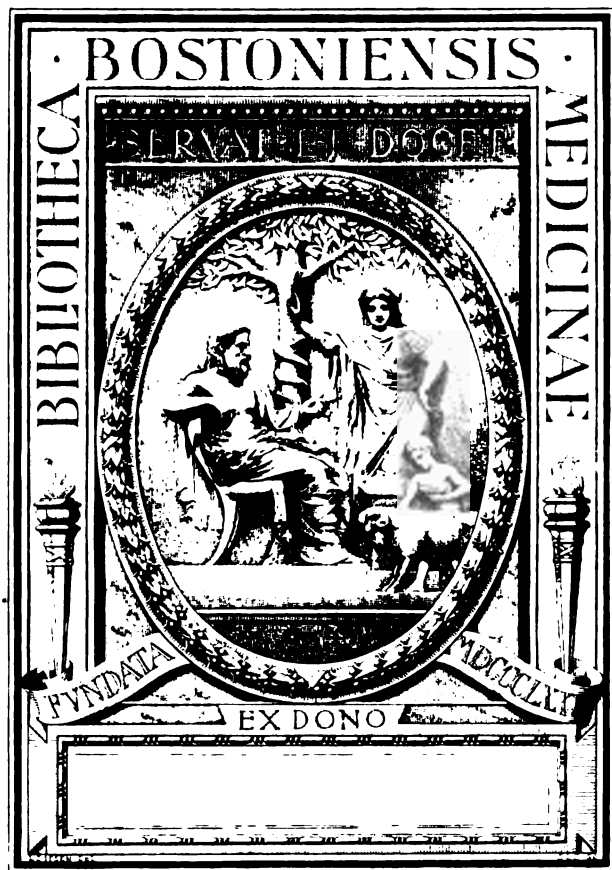
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THE ANNALS OF OPHTHALMOLOGY.

A QUARTERLY JOURNAL AND REVIEW OF

OPHTHALMIC SCIENCE

FOUNDED BY JAMES PLEASANT PARKER

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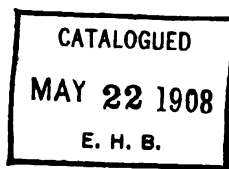
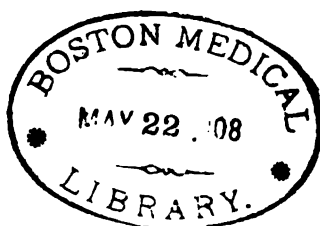
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1907.



10425

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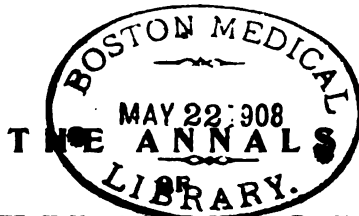
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OPHTHALMOLOGY.

Vol. XVI.

JANUARY, 1907

No. 1

INTRAVENOUS INJECTIONS.*

DR. A. DARIER.

PROF. DE LA FACULTE DE MEDECINE DE PARIS.

MERCURY.—The intravenous injection of the soluble salts of mercury, and particularly of the cyanid, constitutes the last word in the rational therapeutic application of mercury. I would add, that after showing myself sceptical as to its value for a long time, I have become, after ten years, a devoted partisan; and that now it is to these intravenous injections that I have recourse almost exclusively.

Of course it is a delicate procedure, difficult for unskilled hands; but practiced by a physician schooled in the principles of antisepsis, and of modern clinical technic, it presents advantages of the very first order. These are: *absence of all pain; an action rapid, certain and exact; absence of local lesions* (infiltrations, nodosities, etc.); and *without late secondary effects*, as is so often the case with intramuscular injections.

The solution to be employed must be clear and thoroughly aseptic, and *above all free from cocain* or any other analgesic, which might act too violently on the heart or nervous centers. The solution which I recommend, and which my experience has proven to be innocuous, but of beneficial effect, is as follows:

<i>Hydrarg. cyanid</i>	0.33
<i>Sod. chlorid</i>	0.08
<i>Sod. phosphat</i>	0.07
<i>Aque dest. et steril</i>	100.

*Translated from "Lecons de Therapeutique Oculaire," 3rd edition; by David DeBeck, Sc. B., M. D., by request of the author.

Of this, two or three c. c. are to be injected into one of the veins at the bend of the elbow, taking care to deliver the injection very slowly.

The technic is simple, and more rapid even than hypodermic injections, since it is not necessary to even partially disrobe the patient. Rarely are there persons in whom the veins are difficult to find, yet there are such. In these cases it will be necessary, in default of the better plan, to have recourse to subcutaneous, or intramuscular injections.

To make more prominent the vein, one applies one or two turns of a bandage, tied tightly around the arm above the biceps. During the production of the venous stasis, one washes the site of the injection with a tampon of cotton soaked in chloroform, alcohol or sublimate. The needle, a fine platinum one, with iridium point, is passed through a flame, and then introduced cautiously into the vein. Before injecting, one aspirates slightly to see if the blood can be drawn into the syringe. (On this account the syringe should not be entirely filled, but a little space left to allow for this aspiration.) If the blood appears in the syringe, one can be sure that a false passage has not been made. The bandage is then released, and nothing remains but to slowly (4 or 5 seconds) push the liquid into the vein. The patient complains at most of a sensation of chilliness; or occasionally of a taste of almonds in the mouth (?). The needle is to be withdrawn quickly, and a slight compression made with a tampon of cotton over the point of puncture. After this a drop of collodion will seal hermetically the imperceptible orifice.

One should always make the injections in each arm alternately so as to not too greatly weaken the vein, which naturally after a great number of punctures will thicken, and finally become at that spot painful to further injections. This is the principal objection that has been made to intravenous injections; but it is always time to return to the hypodermic method when the venous route will not permit the continuance of this treatment. After a certain number of punctures, it is often necessary to change the vein, or return to the hypodermic method, to allow repair in the vein, which otherwise will become finally occluded.

Very nervous patients, the first time, have some apprehension, which leads them readily to find fault; this is, above all, the case if the injection is too rapidly pushed into the vein, or if it seems to them that the physician himself is not sure of his method. But such little inconveniences are entirely compensated for by the very great advantages of the intravenous injections.

In using the intravenous injections of cyanid of mercury, one should not neglect before each new injection to ask of the patient if he has experienced since the last injection any colic, or has had any diarrhea. In event that he has, the dosage should be diminished or the injections made less frequently.

It is well, after the first series of thirty injections, to discontinue them for a month. Then we can resume with a second series, and even a third. Sometimes, in certain affections of a slow and insidious evolution, like keratitis parenchymatosa, and cases of chorioiditis and irido-chorioiditis, one may be obliged to make, in the course of two or three years, from one hundred to two hundred injections.

I have made, personally, thousands of intravenous injections, without complication, except occasionally a slight phlebitis, where a little of the liquid has escaped outside of the vein. The entrance of large bubbles of air into the veins of the arm is without danger; and it has occurred to me to inject a full syringe of air without any inconvenience.

(It is always hard to escape from the influence of early teachings. I can hardly imagine myself making these injections without going through the routine of pushing up the piston until a drop of fluid shows at the needle tip; and with a bubble of air actually visible in the barrel I doubt if I could have the courage to refrain from forcing it out. This is especially true as the air is, to say the least, unnecessary.—Dé B.)

As to complications to be feared, they are exceedingly rare; and I have known of but few, not caused by an unskilful injection outside of the vein. One has in this case merely made a hypodermic injection; in a part of the body, however, very rich in vessels and nerves, and consequently unduly sensitive.

An infectious phlebitis has never, I maintain, been observed,

and it is hardly possible if the needle has been previously heated. For my part, in ten years' practice, I have never observed any untoward results. I have never observed with these intravenous injections any complications more serious than with hypodermic injections. It is certain that these two therapeutic methods, and especially the latter, should be applied by physicians worthy of the name, and not left to young and unskilled hands.

With the physician rests always a great responsibility. I once by mistake made an injection of a solution of cocain, producing thereby a profound and prolonged syncope, but fortunately not fatal. But this mistake might have been made equally as well with the hypodermic method.

A military surgeon, whom I will not name, has had three cases of death following intravenous injections of sublimate in cases of rheumatism. It is not the third, nor even the second, but the first of these that should have arrested this deadly experience.

I have collected for the last five years seventeen cases of death following large ("massive") hypodermic injections. To observe three cases of death in an infection so little influenced by the sublimate as is rheumatism (unless really a syphilitic form), does not in the least prove that the method of intravenous injection is responsible for these blunders; but much more are they to be attributed to excessive doses injected into individuals in whom the altered renal filter has become incapable of perfectly carrying out its function. The same doses by the hypodermic route would have certainly had the same deplorable consequences.

(These are the only references Darier makes to sublimate used in this way, and by inference are decidedly disparaging. But others report more favorably on its employment.—DeB.)

In these cases I have found it well to prevent the rapid tolerance established by the organism to the medicinal agent, either to vary the mode of application (inunctions, hypodermic injections, deep injections, sub-conjunctival injections), or to change the variety of salt. Thus I make a first series of twenty to forty intravenous injections of the cyanid of mercury; then allow three months of rest; then I make a new series with the

biniodid (0.01 increasing gradually to 0.03). Finally, if a third series is judged necessary, and we have to deal with one of those forms of tertiary syphilis with rebellious cutaneous complications, or deep osseous alterations, I have recourse to a new salt of mercury, interesting on account of its composition alone.

ENESOL.—This is a *salicylarsenate of mercury*. This salt is very soluble; rapidly eliminated by the urine; is seventy times less toxic than the biniodid, and employed for injection in a solution of three per cent, causes but little pain.

It contains 38.46 per cent of mercury. A centigramme of enesol is equal to 0.0087 of the biniodid. A cubic centimeter of the 3 per cent solution contains 0.0115 of metallic mercury, corresponding to 0.026 of the biniodid.

I have given intravenous injections of enesol of one to two c. c., with the most favorable therapeutic results. I have also employed the same salt in subconjunctival injections frequently, and this with much less pain than with the cyanid. It has given excellent therapeutic results, without provoking the least intestinal reaction. It only produces a slight soreness of the gums after ten days of treatment.

This welcome combination of mercury and arsenic seems to have a better and more marked effect than the arsenic alone, and thus its action on anemic subjects is a distinct step in advance. Therapeutists have long sought a mercurial salt that would be both active and inoffensive. Chemists have given us an ideal salt in the silver series in argyrol, which is strongly antiseptic (?) and yet perfectly painless; but they have not yet found a mercurial salt as perfect of its kind.

In sub-conjunctival injections, enesol is much less painful than the cyanid. In hypodermic injections it looks as if one may infer with certainty that it will replace all known salts requiring as an adjunct an analgesic of some sort; cocain, acotin, subcutin, etc. I will not be surprised to see this double salt of mercury and arsenic acquiring in a short time a very marked importance in ocular therapeutics.

SALICYLAT OF SODA.—The intravenous injections of the mercurial salts had rendered me such service, that after read-

ing the essay of Mendel, I did not hesitate to administer the salicylat of soda by the same method.

Thus I have injected, in cases of iritis, episcleritis and other rheumatic affections of the eye, 0.50 to 0.60 of the salicylat daily into one of the veins at the bend of the elbow. With these doses of 0.60 as the maximum, I have obtained better results than with three or four grammes of the salicylat, or of aspirin given internally; and this without any inconveniences or fears on the part of the patients, nowadays prejudiced against the ill results from the salicylic preparations, such as pains and gastric troubles, deafness, tinnitus aurium, loss of memory, etc.

COLLAGOL.—Credé for seven years past has demonstrated the bactericidal power of this colloidal and soluble compound of silver in affections caused by streptococci, staphylococci, etc. He calls attention to the immense service rendered by the veterinary surgeons in employing collargol by intravenous injections, and demonstrating its powerful and rapid effect in the very grave affections of animals. This is the very sort of experience sought by the physiologists in the laboratory.

Credé has utilized it in intravenous injections of 0.08 to 0.12 centigr. of a 2 per cent. solution, in many infectious conditions; septicemia, puerperal fever, ulcerative endocarditis, peritonitis, osteomyelitis, etc., etc.

Credé's results were excellent, almost without exception; but only lately have I become convinced of their real value. I had first used collargol in the form of a "pommade"; but I believe now with Credé, that its mode of application by intravenous injection is the only true way.

Prof. DeLapersonne has treated by means of intravenous injections of collargol, certain forms of purulent iritis due to systemic infections. In one case the result was remarkable; in a few hours the hypopyon had completely disappeared, and the case was already cured by this single injection. In the other cases, the results have been much less brilliant.

In traumatic cases, equally good results are obtained by collargol, but if panophthalmitis has been once established then nothing can stop it.

THE OCULAR COMPLICATIONS OF MUMPS.

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The first recorded observations of an invasion of the visual apparatus by mumps were made by an American, Dr. E. Rider of Rochester, N. Y., who reported two cases of dacryoadenitis due to epidemic parotitis, at a meeting of the New York State Medical Society, in 1872. Hatry, in 1876, published ten cases of neuro-retinal disease due to mumps, the first of the kind to be reported. A prolonged search of the literature discloses that since then, at least thirty papers and reports, in discussion of the ocular complications of mumps have been published by English, American, French, German and Italian authors. Inasmuch as the search was made with great care, it may be assumed to include practically all of the authentic and true cases reported up to the present time.

The salient fact disclosed by this review is, that far from being the benign malady it is so often assumed to be, epidemic parotitis is a disease endowed with a potency for evil to the visual organs that is not to be despised. The range of its ocular complications extends from abscess of the eyelids to retro-bulbar optic neuritis. These morbid processes may terminate in complete resolution and perfect restoration of function, or they may end in atrophy of the optic nerve, and blindness of both eyes. The period in the course of mumps during which ocular complications most frequently supervene is when the usually observed symptoms of the disease have begun to subside, or within a few weeks after they have subsided. Abscess of the eyelids and dacryoadenitis, however, have, in a few instances, preceded by a number of hours or days the well-known signs of mumps.

Up to the present time, no perfectly satisfactory explanation of the mode of production of the ocular or other metastases has been propounded. The toxin theory seems to be the most logical, but it is still in the realm of hypothesis. Nothing hitherto observed in the characteristics of an attack

of mumps may be construed as an indication that an ocular complication is impending. The treatment of such complications, when they do occur, with the exception of abscess and iritis, seems to have had a very moderate influence upon the course of the malady. The course of the complications, generally speaking, is toward recovery. Those cases which have gone on to a disastrous termination have done so notwithstanding vigorous medication.

A brief summary of the lesions will show at a glance their diversity:

<i>Optic neuritis and neuro-retinitis</i>	23 eyes
2 were totally lost;	
2 sustained a marked loss of vision;	
8 made an imperfect recovery;	
11 made a complete recovery.	
<i>Retrobulbar optic neuritis</i>	3 eyes
3 made a complete recovery.	
<i>Atrophy of the optic nerve</i>	6 eyes
4 sustained a marked loss of vision;	
2 sustained a nearly complete loss of vision.	
<i>Iridocyclitis (1 totally lost)</i>	1 eye
<i>Iritis</i>	6 eyes
3 made a complete recovery;	
3 made an imperfect recovery.	
<i>Keratitis (complicating one of the cases of iritis)</i>	1 eye
1 made an imperfect recovery.	
<i>Dacryoadenitis</i>	14 cases
<i>Conjunctivitis</i>	28 cases
<i>Abscess of the eyelid</i>	1 case
<i>Dacryocystitis</i>	1 case
<i>Paralysis of the accommodation</i>	3 cases
<i>Paralysis of extra-ocular muscles</i>	3 cases
<i>Hemeralopia</i>	1 case
<i>Amblyopia in which ophthalmoscopic examination</i> <i>was not made</i>	1 case
<i>Dimness of vision (Joly)</i>	12 times
<i>Narrowing of color fields (Joly)</i>	3 times
<i>Narrowing of fields of vision (Joly)</i>	5 times
<i>Lesions discovered by ophthalmoscope (Joly)</i>	24 times

I am fortunate in being able to present the complete history of a case of neuro-retinitis that came under my per-

sonal observation, and which has been published elsewhere,* and to append the pathological report on the specimen, made by Dr. F. E. Sondern, of New York City. This is the only case of its kind in literature so far as I have been able to discover, in which a pathological examination of the specimen has been made. Following the history of my case, an abstract of the published cases will be found subdivided into two sections, as the context will show. Every effort has been made to include every published case in the abstract, and no pains have been spared to eliminate every error from it.

A case of unilateral (left) optic neuro-retinitis, due to infectious parotitis in a girl eleven years of age, resulting in blindness of the affected eye. Enucleation of the eyeball three and one-half years later for proptosis caused by anterior staphyloma. Report on the pathological condition of the specimen by Dr. F. E. Sondern.

Katharine C. —, eleven years of age, was brought to me April 5, 1902, by advice of her physician, Dr. M. H. Eddy, of Middlebury, Vt., with the following history: In February, 1902, she had had mumps. At the beginning of the disease, her physician had not seen her; but after the swelling in the parotid region had begun to subside she became feverish and delirious, and then he was called. Within a few days the fever and delirium subsided, and the case progressed toward recovery, but with persistence of noticeable tumefaction in both parotid regions. About three weeks after she was taken ill, she was able to resume her school work. While studying she had attacks of vertigo, and from time to time momentary failure of vision of her left eye occurred. During this period, lacrimation and suffusion of her left eye were added to the symptomatology. Notwithstanding these symptoms, she continued her attendance at school four or five weeks. During the last week, after reading fine print by artificial light, she had an attack of severe pain in her left eye which lasted half an hour; and after that the left pupil remained permanently dilated. Dr. Eddy was then consulted for her ocular condition, and he referred the patient to an experienced ophthalmologist, who, on March 27, 1902, found "general redness of the left eye, the cornea hazy, the pupil dilated, the intra-

*New York Medical Journal, January 2, 1904. Ibid., January 19, 1907.

ocular tension raised (+2), and numerous large blotches in the fundus which looked like hemorrhages. It was much the picture of thrombosis of the central vein; but the cornea was so hazy that no details of the fundus were really seen. The lower part of the fundus gave a whitish reflex. Vision was light perception; the upper part of the field of vision was blind. Anterior sclerotomy was performed. On April 3d, the cornea was less hazy, the fundus was a little more distinct, and here and there a blood vessel was visible."

These facts were given me in a letter from the oculist on April 5th, when I made my first examination of the case. I found the girl's right eye normal in every respect. The vision of her left eye was perception of light. The conjunctiva was congested, and the veins in the ciliary region were engorged. The left eye diverged a little, and was a little more prominent than its fellow, but neither paralysis nor paresis of any extrinsic ocular muscle was discovered. The pupil was completely dilated and immovable. The retinal veins were larger than normal, and tortuous, and breaks in the dark line of the veins were distinctly seen. A number of apparently normal retinal arteries were visible, and a number of whitish streaks were found in the fundus that seemed to be empty arterial twigs. The greatest disturbance was in the region of the optic disk, which was so edematous as to be unrecognizable. No disease of the kidneys was discovered at any time in this case; and the anemic heart murmur, which was present at the examination on April 5th, was not detected at any subsequent examination. There was no systemic taint of any sort.

On July 10, 1902, the patient came to me for the second time. Her right eye was normal. The vision of her left eye was perception of form in the temporal part of the field of vision. The sclera was clear and not injected. The pupil was fully dilated, but it contracted slightly in bright daylight. The pupil was oval with the long axis vertical, giving an appearance as though a small iridectomy had been performed above; but no operation save the paracentesis already mentioned had been performed upon the eye. Floating particles were visible in the vitreous. The optic disk was not defined. The retinal arteries and veins were pretty well obliterated. A large white-streaked patch occupied the macular region;

and white spots were scattered about the optic disk. These white areas were taken to indicate atrophy of the retina and chorioid. The intraocular tension was plus $\frac{1}{2}$. The patient had no subjective symptoms.

November 28, 1902.—The right eye was normal. The left eye counted fingers at one foot. The pupil was in the same state as at the previous examination. The eyeball was normal in size and in position, but it was tender to pressure under the supraorbital foramen. Exploration of the orbit with the finger, which could be pushed behind the equator of the eyeball, failed to reveal the presence of an intraorbital growth. The excursion of both eyeballs was unrestricted, and both eyes moved together normally. The patient had not suffered from pain and had enjoyed good general health.

July 16, 1903.—Since her last visit the patient has had chickenpox, whooping cough, and a severe attack of grippe. During the spring she attended school six weeks; but she discontinued school work then, because when she studied hard she was dizzy. She has no pain in her eyes or head. The right eye is normal. The left eye flushes when she is tired; at other times it is clear. The sclera is clear today. The pupil is dilated as before. The cornea is dull, but perfectly transparent. There is very little fundus reflex, and it is not possible to distinguish detail in the interior of the eye. The loss of fundus reflex is probably due to the several constitutional diseases that assailed her during the winter. The intraocular tension is plus $\frac{1}{2}$. The eyes move together normally. Her general health is perfect. It seems fair to conclude that, in spite of the severity of the inflammation in this case, the eye will maintain a sufficient degree of health to insure the preservation of the globe.*

On July 13, 1904, Dr. Eddy, in a personal interview, stated that the patient was in good condition.

On July 7, 1905, I saw the patient for the first time in two years. She had had in these two years only two attacks of pain in her diseased eye, which were preceded by a feeling of a "lump in her stomach." In March, 1905, she had had a toothache, and her left eye became red and painful for a day or two. At the present time she has no pain in her eyes or head. During the past week she has had some vertigo when

*New York Medical Journal, January 2, 1904.

she holds her head forward. The left eye becomes suffused sometimes, but not as it formerly did. Divergence of the left eye was marked. There was a marked anterior staphyloma, causing the eyeball to protrude between the eyelids in a disfiguring manner. The pigmentation of the uveal tract was visible through the stretched sclera in a number of places in the circumcorneal region beneath the upper lid. Nevertheless, the eyelids closed readily over the enlarged globe. There was neither congestion, nor tenderness, nor pain about the diseased eye, nor had there been during the preceding two years, excepting as noted.

I advised enucleation, and possibly evisceration of the orbit. It was not possible to state positively that malignant degeneration had not begun within the eyeball. The probabilities, however, were strongly against that supposition, for there was no history of prolonged pain; the intraocular tension, although greater than normal, was not high; the proptosis was evidently not due to an increase in the contents of the orbit behind the eyeball; the development of the anterior staphyloma had been very slow (one year); and the general health of the patient was, and had been, with the exception only of acute illnesses, excellent. There was some swelling of the right optic disk at the upper and lower borders. The vessels of the right fundus were tortuous, but the function of the eye was not affected. Vision was normal.

Owing to other engagements, I could not continue the treatment of this patient, and the eye was enucleated by another surgeon in August, 1905. I am much indebted to Dr. M. H. Eddy for the privilege of securing a pathological examination of the specimen, *the only one ever reported in a case of this nature.*

REPORT OF THE PATHOLOGICAL EXAMINATION, BY
DR. F. E. SONDERN, MAY 21, 1906.

Cornea: In fairly good condition; the epithelium is intact.

Bouman's Membrane: Intact and well marked.

Descemet's Membrane: Intact and well marked.

Cornea Propria: Has the appearance of having presented slight opacities.

Iris: Presents quite a large amount of pigment; and is atro-

phied. There is an anterior synechia with fusion a distance of $1\frac{1}{2}$ m. m. from the angle.

Fontana's Spaces: Obliterated.

Schlemm's Canal: Obliterated.

Posterior Chamber: Greatly deepened, the anterior segment of the globe having been pushed forward.

Lens: In a condition of cortical cataract.

Ciliary Body and Processes: Atrophied.

Retina: The inner layers appear to have taken on a connective tissue proliferation, and in some portions this tissue takes on a hyaloid form, especially in the neighborhood of what appears to have been vessels, which it appears to have obliterated. The remainder of the retina is completely disorganized. The external limiting membrane can be seen, but the rods and cones have entirely disappeared.

Chorioid: Has in some places apparently fused with the sclera where it has disorganized. In other places, it is apparently free and engorged with blood.

Sclera: Appears to be normal.

Optic Nerve: Section of the optic nerve shows complete atrophy of the nerve fibers, which have been replaced by a very dense hyaline connective tissue. There is an extensive obliteration of the small vessels in the sheath of the nerve. The obliterated vessels appear as hyaline islands. There is considerable pigment, light brown and black, scattered through the tissue replacing the nerve near its entrance to the sclera."

Although carefully searched for, no evidence whatever of malignant disease was found. The case was one of proliferating neuro-retinitis, due to mumps. The proptosis was a consequence of the increased intraocular tension from secondary glaucoma, produced by obliteration of Fontana's spaces and Schlemm's Canal.

BIBLIOGRAPHY OF THE OCULAR COMPLICATIONS OF MUMPS.

Authors Who Have Reported Personal Observations.

RIDER: *Two Cases of Inflammation of the Lacrimal Gland in Mumps* (*Transactions of the New York State Medical Society, 1872*).

So far as my reading goes, no recorded observation of dacryoadenitis following parotitis has been made. The fol-

lowing cases have no practical value, but they have a scientific interest which may at some time prove important practically, so that it seems worth while to put them on record.

In the summer of 1869, during an epidemic of mumps in the St. Mary's Orphan Boys' Asylum, a boy was brought from that institution to my clinic at St. Mary's Hospital. After the swelling of the parotid had reached its height there had also appeared a large tumefaction of the upper lid of the left eye. The patient was unable to open the eye, and indeed the edema was so great that it was with difficulty that the lids could be so separated as to disclose the eyeball, which appeared unaffected in every respect. The tumefaction was hardest at the upper and outer margin of the orbit. Taking into account the parotitis, I told the Sister in charge that the swelling would probably subside in a few days, and that no treatment was required.

A few months thereafter, in January, 1870, I was asked to see J. D., aged 20 years, a patient at the City Hospital, suffering from the same affection. After the subsidence of the swelling of the parotid had begun, the testicle had become inflamed, and for this affection he had been taken as a patient into the hospital. The swelling was leaving the testicle when it appeared in each upper eyelid. The appearance of the inflammation, the diagnosis and the treatment were the same as in the first case. In both, the swelling disappeared in a short time, leaving the function of the glands unimpaired.

Considerations sur des troubles visuels observés avec l'altération de la papille, et de la zone peripapillaire, chez les malades atteints d'oreillons pendant l'Hiver de 1875-76.

HATRY: *Mem. d. Med. d. Chirurg. et d. Pharm. Series 3, 1876, p. 305.*

In an extended article the author describes what he believes to be the only observations on this subject, and reports at length some ten cases, the first to be reported.

CASE 1. Soldier, age 24, entered hospital March 30. Disease began March 24, with headache, thirst and anorexia. Following day both parotids much swollen; five days later entered hospital.

March 31, complained of a mist before the eyes; this lasted many days. Bulbar conjunctivæ injected.

April 5, severe frontal headache, parotids decreased;

marked swelling of upper lids; palpebral conjunctivæ red. Complained of a gritty sensation of lids and globe. Visual field normal; color sense altered; no photophobia or photopsia. Vision both eyes, 2/15.

With ophthalmoscope: Pupils normal; direct image of right ground could not be obtained. Inverted image showed the following: O. D. Papilla red throughout, especially at external segment, where chorioid was not distinguishable; borders of papilla indistinct; extensive peripapillary effusion; veins and arteries turgescient; veinous pulsation; chorioid intact, slightly pigmented.

O. S. Conditions similar to right; optometer showed same conditions in both eyes.

April 6, no change.

April 7, submaxillary glands involved; fever increased.

April 10, vision 1/10; much vertigo on standing. No severe pain, but photophobia. Intraocular tension increased, lids less swollen, also parotids; submaxillary glands much distended; fever increased; fluctuation present. With ophthalmoscope: Veins less swollen, arteries double normal size, papillæ concealed, borders diffuse; infiltration marked; retinal vessels obscured by whitish streaks. These symptoms were the same for both eyes.

April 14, submaxillary glands incised, much pus obtained. Eye condition as on previous day.

April 20, adenitis much improved; retinal arteries nearly normal; veins still swollen. Papilla can be defined. Sight obscured, as though seeing through smoke.

May 2, conditions much as at last examination; vision improving; 1/2 each eye.

May 10, visual complications clearing up.

May 15, ophthalmoscopic examination showed a nearly normal eye; vision 4/5 both eyes. Patient discharged.

CASE 2. Patient, soldier, age 24, observed seven days after onset of disease. Parotid swelling not marked; mild headache and fever. Patient had not noticed any change in vision before examination.

Ophthalmoscopic examination as follows: Sclera white, pupil contractile and slightly dilated. No bulbar conjunctivitis; slight palpebral injection; visual field normal; no alteration in color perception; vision 2/3 in each eye.

O. D. Papilla considerably injected; one could scarcely distinguish the papilla from the surrounding injected chorioid.

The disk was not limited, nor would its existence have been known except for the point of emergence of the vessels. Arteries double normal in size; veins turgescant and swollen. All around the papilla one noticed a zone of white infiltration. The chorioid looked like marble, and the venæ verticossæ were very apparent. Ophthalmoscopic image of the left eye similar to the right, except the changes are more advanced. A week later, conditions much improved; papillary injection decreased; arteries normal; peripapillary injection nearly disappeared; vision 5/6 both eyes. (No further account given.)

CASE 3. Soldier, age 23; onset with headache and swollen parotids; also involvement of right testicle. Examination fifth day of disease. Slight parotid swelling; sclera white; eyes blue; pupils normal; visual field and color perception normal; vision 2/15; lids swollen; lacrimation, grittiness felt. Palpebral and bulbar conjunctivæ injected, giving a rose color; photophobia. All these symptoms appeared at the time of onset of disease.

O. D. Papillary tissue injected; papilla confounded with chorioid; veins swollen; arteries double in size; papillary borders diffuse; much infiltration; chorioid pigmented.

Same condition in left eye. Five days later, eye changes ameliorated; papillary zones recognized; infiltration clearing; photophobia still present. Ten days later, improved; fifteen days later, discharged normal.

CASE 4. Soldier, age 24, had been under treatment at the infirmary twelve days, for double parotitis and orchitis. While eating with a comrade, he suddenly became unconscious and fell. He was taken to the emergency hospital, where Hatry saw him one hour later. Ice at head, mustard foot bath, and leeches to each mastoid was the treatment used. Three hours later he became semi-conscious. Next day the picture was: Patient in a position of dorsal decubitus; frontal, orbicular, zygomatic muscles in a state of convulsive contraction every two seconds; right lid more shut than left; pupils normal; convulsive movement of limbs; sensation increased; skin lead-colored; responded with difficulty to questions; felt cold, and seemed to be suffering much; temperature 40° C.; pulse 96.

Pressure on abdomen caused pain and increased contractions, especially of the right side. Left testicle much swollen and painful. With ophthalmoscope, ground of eye seemed smoky, papilla not clearly definable, vessels swollen, vision not obtainable. During the night vomited greenish matter. On the following day the patient was conscious and calm. Convulsive movements appeared only on abdominal palpation, or palpation of the left testicle. Patient replied to questions; stated that he had never had any nervous affections.

The film seen with the ophthalmoscope had almost disappeared; in its place one noted a marked zone of peripapillary infiltration. Vessels much swollen.

On the third day convulsive movements were absent, and the patient walked about the room; no conjunctivitis; no film; less swelling of vessels.

On the seventh day the patient was well, the eye had cleared. There was no abnormality in either fundus.

CASE 5. Soldier, age 25, entered hospital April 15, with parotitis and orchitis. April 19 (ninth day), blond, eyes gray, pupils normal, cornea clear, no conjunctivitis; vision, O. D. 2/13, O. S. 1/5; visual and color fields normal.

O. D. Hypermetropic, papilla much injected, especially at outer border. The retinal veins are indistinct at their origin, but appear clearly in papillary zone. O. S. Same conditions more marked.

April 23, parotid and testicle swelling gone; eyes clear; papilla and vessels normal; vision, O. D. 2/3, O. S. 1.

CASE 6. Soldier, age 24, April 6, had severe headache, thirst and loss of appetite. Two days later parotids became swollen, and sight became poor. April 8, entered hospital. Parotids mildly swollen, right testicle also. Eyes gray; vision, lids and cornea normal; slight conjunctivitis; papilla slightly injected; vessels swollen; marked zone of peripapillary injection, same size as disk; both eyes similar.

April 17, parotitis disappearing; eyes clearing.

April 20, patient well; eyes normal, except that the vessels seem larger than normal.

CASE 7. Soldier, age 26, entered hospital April 10, for parotitis and orchitis; also for poor sight. Trouble began April 5; seemed to see through a fog. Examined April 10. Blond, eyes gray, no bulbar, but slight palpebral conjunc-

tivitis; pupils normal; visual and color fields normal; vision, O. D. $1/2$, O. S. $2/3$; parotids swollen; right testicle swollen, tender and red. O. D.—Papilla oval, greatest diameter vertical, uniformly injected; borders of disk diffuse, especially outer. Chorioid like marble; one cannot distinguish the location of the venæ vorticosæ; marked turgescence of the retinal veins; peripapillary zone diffuse and congested.

O. S. Same general conditions as right.

April 13, conditions are unchanged.

April 20, parotids have subsided; papilla is still injected, but retinal veins are normal, and peripapillary injection is absent.

April 24, ophthalmoscopic image is normal; vision $4/5$ both eyes; discharged.

CASE 8. Soldier, age 23, admitted April 15, for parotitis. Disease began April 5. On admission, parotids swollen, headache, poor vision; O. D. $2/3$, O. S. $2/3$; visual and color fields intact; no photophobia or phosphenes; palpebral conjunctivitis; gritty feeling to lids; no bulbar conjunctivitis. O. D.—Papilla much injected, especially externally; borders diffuse. Red tint of papilla is barely distinguishable from that of the ground of the eye—only distinguishable because the emergence of the vessels are a guide; arteries large and paler than the veins; no chorioid changes noted; both pupils react markedly to light. Left eye same as right.

April 18, conditions little changed; parotids decreasing.

April 25, vision $5/6$ both eyes; parotid swelling and conjunctivitis disappeared; retinal vessels normal; red tint of papilla less marked; disk still injected. Patient left hospital at own request.

CASE 9. Soldier, age 23, entered hospital April 12, with diagnosis of parotitis and orchitis. Patient blond, eyes gray, pupils moderately dilated and react normally; a little palpebral injection, no bulbar. Patient stated that since the onset of the disease his vision had been poorer than usual. His vision had always been poorer in the right eye than in the left. Vision: O. D. $1/20$, O. S. $1/2$; no strabismus nor nystagmus. O. D., with ophthalmoscope, the characteristic changes were present; papilla injected, especially externally; borders of disk diffuse; retinal vessels swollen; no venous pulsation; chorioid intact.

O. S.—Direct image not obtainable. Reverse image gave same condition as left, only more severe. Chorioid sound.

April 24, the examination of patient revealed a return to the normal state; vessels normal size; papilla clear; borders distinct, and vision O. D. $1/15$, O. S. $4/5$.

CASE 10. Soldier, age 24, entered hospital April 8, for parotitis and orchitis of eight days' duration. Patient complained of headache and difficulty in retaining solids. He had marked swelling of parotids, and painful swelling of left testicle. He stated that he could not see as well as usual.

Examination eighth day of disease: Patient blond, iris blue, pupils dilated but contractile; no conjunctival injection; no photophobia; no phosphenes; visual and color fields normal; vision $1/2$ both eyes.

O. D.—Papilla oval, greatest axis transverse, chorioid boundaries not defined. The veins are double the normal in size and very tortuous. Retinal arteries also much swollen, Papilla uniformly injected; a surrounding well-marked infiltration is present. The chorioid is a little depigmented, but otherwise normal.

O. S.—Similar to O. D.

April 12, no eye changes noted; vision as before.

April 20, parotitis disappeared; patient complains of a mist before the eyes; vision O. D. $2/3$, O. S. same. Papilla is still injected somewhat, but the vessels are reduced in size. The infiltration area has cleared.

April 21, patient insisted on returning to his duties.

SCHIESS-GEMUSEUS: *Metastatische Iridocyclitis nach Parotitis Epidemica* (18 Jahresb. d. Augenheilanstalt Basel, pp. 38-39, 1882).

Adolf D., aged 6 years, admitted to hospital Aug. 12, dismissed Sept. 24. Gives history of having been in perfect health until eight weeks previously, when he and his brothers and sisters contracted parotitis epidemica. The left eye became red, and soon vision became impaired, although he did not complain of any pain.

Present condition: Healthy, well-nourished boy. Right eye normal; left eye, marked pericorneal injection. Several small bluish points above and inwards, occurring about one-fourth of the corneal width removed from the margin, external to the limbus. Cornea perfectly clear. Chamber very

shallow, considerable hypopyon at the base. Iris much discolored and swollen. Central portions protrude sail-like and are covered with a vast number of reddish vessels. Pupil is totally adherent, retracted, funnel-like, and covered with yellowish exudate. Tension slightly diminished. Slight pain on pressure. Vision only quantitative. Under treatment with atropin and cataplasmata the hypopyon diminished, but the small staphylomatous prominences increased in size. By Aug. 24 they had withdrawn into the scleral niveau; their former site being recognized by a slight bluish discoloration of the affected portions of the sclera. The bulbar injection had diminished somewhat by Sept. 1. Still slight pain on pressure. Cornea has become clearer, chamber is almost normal. Iris discolored and swollen. The tension continued to decrease up to Sept. 9. The bulbus was then removed out of the consideration for the right eye.

Section. Upon opening the bulbus, macroscopic inspection showed the retina and chorioidea to be perfectly unchanged. The anterior portion of the vitreous body was normal, the posterior portion more fluid. Lens was softened. The ciliary body was almost normal in its anterior portions. The iris, however, was considerably hypertrophied, attaining a diameter of three millimeters. It presents a peculiarly striated marking with well developed vessels, especially in the portion situated most anteriorly. The tissue is very elastic and resistant. The anterior capsule of the lens and the ciliary processes have firmly united with the posterior wall of the iris; no adhesions exist between the anterior surface of the iris and the posterior wall of the cornea. The cornea itself is slightly thickened. The lens has advanced to a marked state of fatty degeneration, encroaching on other parts where the lens fibers could not be determined. Many cellular elements and pus corpuscles in various stages of degeneration occur in the posterior portion of the vitreous body.

TALON: *Observation d'atrophie du nerf optique consecutive aux oreillons* (*Archives de Medicine et de Pharmacie Militaires*, Tome 1-2, 1883).

Visual disturbances subsequent to mumps are perhaps not so rare as would seem to be the case, judging from the small number of published cases. These ocular complications may appear late, involving only one eye, and rapidly subsiding,

so that they probably sometimes escape the attention of the physician and of the patient himself. However, exceedingly grave and permanent lesions may develop as the sequel of an affection which is usually regarded as benign.

Towards the end of a benign epidemic of mumps, a strong and healthy young soldier suffered from severe parotid swelling, especially on the left side. There were some general symptoms, such as fever, languor and anorexia, and a mild (right) orchitis. At the end of three weeks, the patient had recovered. Four weeks after the onset of the disease, he noticed for the first time that vision in the right eye was much poorer than in the left, a fog seeming to rise between the book he was trying to read, and his eye. Since the preceding evening he had suffered from a very severe frontal headache, with a sensation of gravel between the lids. These symptoms were attributed to a mild existing conjunctivitis. Two days later, vision in the right eye had almost disappeared. The right pupil was found to be dilated, and almost inactive to light. The headache had become more severe, and there were vertigo and nausea. Whereas the visual acuity of the left eye was about normal, the vision of the right eye was below 1/10. The ophthalmoscopic examination showed lesions similar to those pointed out by Hatry, and described by authorities as characteristic of neuro-retinitis and neuritis of the optic nerve. The diagnosis of optic neuritis was accordingly rendered, and confirmed by an eye specialist. The visual function at first slightly improved under treatment (potassium iodide and cathartics), but two and a half months after the onset of parotitis, vision in the right eye was definitely and permanently lost. At this time, the ophthalmoscope showed the most evident lesions of atrophy of the papilla. The left eye was found to be normal.

Summary of observation: Extensive mumps, followed by cerebral manifestations; associated neuritis and subsequent atrophy of the right optic nerve, resulting in loss of vision on the affected side.

SWAN M. BURNETT: *Affections of the Eye Accompanying Mumps* (*Amer. Journal of the Medical Sciences*, 1886, p. 86).

From a study of the cases reported up to the present time, the author found that the principal parts of the eye to suffer from a metastasis of the mumps to that organ were the lid,

conjunctiva, and *optic nerve*, also (in the author's case) the third pair of nerves. The exophthalmos present in his case he thought due mainly to the paralysis of the ocular muscles, allowing the cushion of the orbit, by its elasticity, to push the ball forward, though it seems highly probable that there was at the same time a serious infiltration of these tissues, as there was of the conjunctiva and lid. The disease may be unilateral, and of varying degrees of intensity. The prognosis of the affection seems to be in the main good, the only case terminating in blindness being that of Talon. This, however, suggests the possibility that some of those atrophies of the optic nerve, especially when unilateral, which are accidentally discovered, and the origin of which cannot be traced to any of the hitherto recognized causes, may be due to a metastasis of mumps in childhood. As regards the pathology, anything in the way of explanation must, from the paucity of accurately observed data, be merely speculative. Hatry and Talon looked upon the eye trouble as consecutive to a cerebral complication. This does not seem possible to the author in all the cases reported, however.

The following case fell under his own observation:

The patient was a colored boy of 15, who stated that mumps had been going the rounds of his family, and that he had a slight affection of the *left* gland. On the third day of the disease he got wet, and two days after he noticed that his *right* eye was affected. On the fourth day of the eye trouble he applied for treatment. The author found the upper lid much swollen, and the patient was unable to elevate it. On raising it, the cornea was found to be intact, but there was a considerable clear chemosis of the conjunctiva at the outer and inner portions. The pupil was dilated, but not ad maximum, and there was a paralysis of accommodation. There was diplopia in the upper, lower and extreme left fields of fixation, and the upward and downward movements of the eye were visibly restricted. There was a noticeable exophthalmos. Ophthalmoscopic examination showed the media to be clear, and the outlines of the disk sharp, but there was a marked tortuosity of the retinal veins. He was advised simply to bathe the eye in hot water. Three days later, the lid was much less swollen, and he could raise it somewhat. The restricted movement was about the same in upper fixation field,

but was improved below; pupil smaller; chemosis almost gone; some slight exophthalmos. Ophthalmoscopic appearances unchanged. A week after the patient came under treatment, the pupil was found to be smaller, and accommodation slightly restricted. Diplopia of about 20° up and down from the central point of fixation, and at the most extreme left field; ptosis better. Tortuosity of retinal veins not so great. The patient was not seen after this, from which the author infers that he went on to recovery more or less complete.

BAAS: *Eine seltene Folgekrankheit epidemischer Parotitis* (Klin. Monatsbl. f. Augenheilk., 24, 1886).

The patient was a girl 7 years of age, who complained of photophobia, and was temporarily entirely unable to read. The pupil was of medium width. Diphtheria and other diseases being excluded, the sole cause of the paresis of accommodation appeared to be an attack of mumps, which the child had suffered from about three weeks previously. The attack had been a mild one, and the patient had not been kept in bed. The author comments upon the fact that no similar case has come under his observation in several epidemics of mumps.

BLANCHARD: *Atrophie double de la papille consecutive aux oreillons* (Le Bulletin Medical, 1889, p. 1091).

Author reports personal observations of a case of mumps in a male 23 years of age, which ran a normal course for about a month, when the patient was apparently convalescent. Metamorphosis and dimness of vision supervened, and in five days the patient had to be led. Three months later, there was slight bilateral exophthalmos, divergent strabismus; and limitation of the fields of vision, especially on the nasal side of the right eye. Both eyes were lacrimose, and the injected conjunctiva formed a chemosis around the cornea. The corneæ were clear; the pupils were slightly dilated, and gave no reaction. He could not count fingers. The lens and vitreous were clear, the optic papillæ were pale, and their margins indistinct. The retinal veins were distended; the retinal arteries were contracted. A month later neither strabismus nor exophthalmos was present. The pupils were dilated and reacted sluggishly. The optic papillæ were white; the retinal vessels were shrunken. Vision had improved slightly. This condition persisted. The author excludes all other causes of optic neuritis.

GORDON NORRIE: *Mumps der Thränen Drüsen* (*Centralblatt f. prak. Augenheilk.*, 14, 1890, p. 223, Miscellanea.

You may be interested in learning that I have seen a case of actual mumps of the lacrimal gland. The patient was a girl of 11, who came under observation April 27, 1889. There was a muco-purulent secretion of the conjunctiva, and swelling of both lacrimal glands. On the following day, both parotids were also somewhat swollen, and on the third day epidemic parotitis had fully developed.

V. SCHROEDER: *Ein Fall von Dacryoadenitis acuta bei Parotitis Epidemica* (*Klin. Monatsbl. f. Augenheilk.*, 1891, pp. 427-430).

The author says that the etiology of this case is interesting, because inflammation of the lacrimal gland has not as yet been observed as a sequel or concomitant of epidemic parotitis. The problem of the causative connection between the inflammation of the two glands hardly admits of discussion without the propounding of obscure theories, the more so as the etiological factor of epidemic parotitis itself remains unknown. It is noteworthy, however, that the anatomical structure of the two glands is identical.

A typical case of acute dacryoadenitis, always a rare disease, and here especially interesting on account of its etiology, was observed and treated in the St. Petersburg Eye Hospital. The patient was a married woman, 27 years of age, in good general health and nutrition, free from syphilis, and whose eyes had always been healthy. She developed an attack of bilateral parotitis (mumps), and four days later the left upper lid began to swell, followed after four days by swelling of the right lid. When the patient came under observation one day later, the left eye presented a marked swelling of the upper lid, especially in its outer third; marked chemosis of the bulbar conjunctiva; cornea clear. Movements of bulb somewhat restricted upwards and outwards. In the region of the lacrimal gland, a tumor could be palpated, its boundaries and surface being indistinct on account of the marked swelling of the lid. There was tenderness on pressure. About the right eye, only the external portion of the upper lid was moderately swollen. In place of the lacrimal gland, a small elastic tumor, with a slightly nodular surface, was palpable, and protruded

upon eversion of the lid, presenting a lobulated, roughened surface lined with nearly normal conjunctiva. Bulbar conjunctiva normal; vision almost normal on both sides, with slight hypermetropia. Ocular fundus unaltered. Lacrimal secretion not increased.

The patient remained for two weeks in the hospital, almost all the pathological symptoms subsiding in this time under treatment with warm compresses of a 4% boric acid solution, followed by inunctions with vaseline. In the first few days, the forehead was painted with iodine. Recovery of the left eye was delayed by a not inconsiderable eczema. At the time of her discharge from the hospital only a slight induration of the left lacrimal gland still persisted, which could be demonstrated at the end of another week. After the swelling of the left upper lid had subsided, the protruding, roughened and edematous lacrimal gland could be rendered visible by eversion of the lid. Even after recovery was complete, a small portion of the lacrimal gland remained visible on both sides after everting the upper lid, due to the flat structure of the orbits, and the somewhat prominent bulbs.

While the origin, course and outcome presented no noteworthy features, the author wishes to draw attention to their striking resemblance to parotitis, which would seem to justify the term mumps of the lacrimal gland (Hirschberg), for this form of dacryoadenitis.

ROGER: *Parotitis*. 1899 (*Review de Med.*, Par., V. 19, pp. 361-384).

The original paper reads as follows: "The patients affected with parotitis numbered 52; 32 males, 20 females. It was impossible to establish the contagion in 21 cases; in 10 cases the disease was contracted in an asylum where infectious diseases were constantly present.

"The condition did not present anything peculiar. We observed especially the frequency of orchitis, which was unilateral in 6 cases and bilateral in 3 others. The development of this complication is always manifested by a recrudescence of the fever. In one case which was observed there appeared at the time of the occurrence of the testicular involvement, a protrusion of the lacrimal gland, which became inflamed and very painful.

DOR: *Atrophie Post-Neuritique des Deux Nerfs Optique due aux oreillons*. (*Die ophthalmologische Klinik*, IV., 1900; *Recueil d'Ophthalmologie*, 1900, p. 565).

Author reports two cases of optic nerve atrophy following parotitis. The first patient was a soldier, 23 years of age, who began to suffer from rapidly increasing visual disturbances nine months after recovery from an attack of mumps. Six months later, the diagnosis of optic nerve atrophy was made by the physician in charge. At the end of twenty-three months from the attack of mumps, the author found bilateral atrophy of the papillæ, with considerable narrowing of the visual fields and marked diminution of the acuteness of vision. Treatment proved unavailing.

The author's second case suddenly developed visual disturbances one month after recovery from an attack of parotitis. The first examination, three months later, showed slight exophthalmos, paralysis of the right internal rectus, and bilateral chemosis. The papillæ presented beginning atrophy. Only light perception remained. The exophthalmos and the eye muscle paralysis subsided; and vision improved gradually to such an extent that the patient was able to walk about unassisted. All other causes of optic nerve atrophy than parotitis could be excluded.

SENDRAL: *Des Oreillons Oculaires* (*Recueil d'Ophthalmologie*, 1901, pp. 65-108).

This is an extended article in which the author reports personal observations of two cases.

CASE 1. *Acute Dacryoadenitis Preceding Mumps*.—The patient was a girl 11 years of age. During the afternoon preceding the attack, she complained of lassitude and severe muscular pains, especially in the arms. During the night, she was restless and rubbed her eyes frequently, and her mother noticed that both lids were swollen and stuck together. On the following day, the swelling had increased. Upon examination the case looked at first sight like a gonorrheal conjunctivitis. The upper lids were edematous and indurated, especially at the outer angle. The conjunctivæ were red, and there were some ecchymoses, but no signs of suppuration. The upper lids were elongated and extended over the lower. The patient did not complain of pain. At the outer angle of the eye, attached to the orbit, was a hard swelling that was very pain-

ful on pressure. The diagnosis of the beginning of some infectious disease was made. Five days later the patient manifested all the signs of double parotitis of severe type. All the glandular structures of the neck were involved, and the ovarian region was the site of pain. Ten days after the onset, all swelling had practically subsided. No serious eye symptoms appeared.

CASE 2. Double Optic Neuritis Fifteen Days After the Onset of Infectious Parotitis.—Fifteen days after the onset of the attack of mumps, headache, vomiting and cerebral symptoms occurred, and dimness of vision was noted. Examination revealed dilatation of both pupils, dimness of vision, so that fingers were counted with extreme difficulty, and contraction of the fields of vision. With the ophthalmoscope double neuro-retinitis was found. The retinal vessels were very tortuous, and there was a slight suffusion of the peripapillary region. After severe treatment, slight improvement resulted. All other causes having been excluded, a diagnosis of optic neuritis, due to mumps, was made.

The author ends his article with the following conclusions:

I. Ocular complications of parotitis are severe and appear more frequently than the classics specify. That such cases are more severe than those cases involving the testicles, for these latter do not prevent reproduction, while the former may mean loss of sight.

II.. That conjunctivitis in parotitis, often accompanied by inflammation of the lacrimal gland, is not diagnosed unless searched for.

III. That dacryoadenitis may be either primary or secondary, and may exist as the only evidence of the disease:

IV. Optic neuritis is a grave complication, may occur at any time of the disease, even two or three weeks after a mild case, and may result in recovery, or with atrophy and blindness.

V. That in all cases of parotitis the physician should watch for eye symptoms and treat accordingly.

PECHIN: *Complications Oculaires des Oreillons* (*Recueil d'Ophthalmologie*, 1901, p. 336.)

The author reports personal observations of a case of double subacute iritis in a male patient 22 years of age, who was attacked with infectious parotitis in a severe form on the 17th

of February, which continued until April 6th, when he had recovered from the usual symptoms of mumps.

Right facial paralysis had occurred as a complication early in March, and yielded to faradism. The author saw the case on May 31st. The patient's eyes had become affected the latter part of April; they were inflamed and the vision was bad. This condition persisted during May without other symptoms. The author diagnosed double iritis with posterior synechiæ, and interstitial keratitis in the right eye, due to mumps. All other causes of iritis and keratitis could be excluded. The fundus of each eye was normal. The iritis persisted about five months.

After prolonged treatment, the vision was, one year later, O. D. 1/2 with difficulty, O. S. 1.

The author dwells upon the common belief in the benign character of infectious parotitis, but calls attention to the seriousness of the disease when certain complications arise. He speaks of Hatry, Talon, Dor and Blanchard as having reported cases of severe eye complications. Only two cases, to his knowledge, of involvement of the uveal tract are known: one mentioned by Dor, with iritis, and the author's own case of double iritis with keratitis in one eye, cited above.

STRZMENSKI: *Rares Complications Culaires des Oreillons* (*Recueil d'Ophthalmologie*, 1902, p. 65).

The author reports personal observations of a case of *abscess of the upper eyelid* in a girl of 5, preceding, by forty-eight hours, an attack of mumps.

He reports also the following case of *retrobular optic neuritis* in a female, aged 22, well nourished, and in excellent health, who had been sick for three weeks previous with parotitis. During the mumps she had had moderate fever, but no other complications. As the swelling of the glands subsided, the sight of the left eye began to trouble her. She had never had eye trouble previously. The author examined her several days after the beginning of these symptoms. The ophthalmoscope revealed slight opacity of the optic nerve, accentuated at its border, the retinal arteries contracted and the veins dilated. The chorioid, retina and macula were normal. The perimeter showed a large central scotoma. Otherwise the fields were normal for white and colors. There was moderate dilatation of the pupils, which reacted a little to light.

The treatment was pilocarpin, sodium salicylate and strychnin.

Improvement was gradual, and several months later, except for pallor of the papilla, the eye was normal.

LE ROUX: *Complications Oculaires des Oreillons* (*Archives d'Ophthalmologie*, 1903, p. 665).

The author reports the case of a soldier with parotitis, who was in the hospital twenty-three days, and then ten days with his family. He had moderate fever and swelling of the glands, but no complications, excepting as follows: Fifteen days after the swelling appeared, he noticed a mist before his eyes. He did not remember how long this was noted, but while at home his vision became distinctly bad. Examination revealed the following symptoms: Acuteness of vision: O. D., 1/4, difficult; O. S., 1/4, easy; not improved by lenses. By ski-ascopy, both eyes were found to be emmetropic; there was no accommodative asthenopia; pupils reacted normally; lens and fundus normal; retinal veins a little swollen; papillæ hyperemic. Examination of the visual field revealed a central scotoma for green and red; the periphery was normal.

Two weeks later, the conditions were improved; and one month later the cure was complete.

Syphilis and causes of optic neuritis other than mumps were excluded.

The author states that eye complications are rare, and usually benign. He gives precedence to Hatry in describing a case, and cites the literature of cases so far reported.

MANDONNET: *Paralyses de l'Accommodation et du Voile du Palais Consécutives aux Oreillons* (*Annales d'Oculistique*, Tome 29, 1903; *Gazette des Maladies des Enfants*, 1903, p. 73).

The patient was a boy, 9 years of age, who developed paralysis of accommodation and of the soft palate, accompanied by high fever, shortly after an attack of mumps. Although the pupils were rather wide, actual mydriasis was not present. There was no history of diphtheria. The paralysis subsided in about a month. At the beginning of the disease, the patient complained of diplopia. From this fact, the author assumes the existence at that time of a paralysis of one of the extrinsic muscles of the eyeball.

CAMPANI: *Emeralopia da Parotitis Epidemica* (*Gazz. degli Ospedali e delle Cliniche*, Vol. 24, Aug. 30, 1903).

The author reports the case of a well-nourished girl, aged 16 years, who, during an attack of mumps, developed hemeralopia. The parotitis began on the right side, and was treated externally with guaiacol ointment, the swelling subsiding in two days. The left side then began to swell, and at this time the vision became dim towards evening and gradually got worse, until absolute night blindness came on. During the day, save for some slight pre-existing myopia, the vision was good. Internal and external examination of the eye revealed no objective changes. The left pupil was a little dilated. Both pupils reacted well to solar light, and slightly to strong artificial light. The hemeralopia lasted the whole time during which the left parotid was swollen, about five days, and then vision returned slowly to the normal. There seemed to be no relation between the temperature and the visual phenomena. No internal treatment was administered.

COLLOMB: *Iritis Ourlienne—un Cas d'Iritis Ourlienne Double* (*Revue Medicale de la Suisse Romande*, 1903, No. XXIII, p. 43).

The author regards the etiology of the following personal case as incontestable. A young man, 29 years of age, three weeks previous had an attack of indigestion and fever, with swollen parotids, pain on swallowing, and tinnitus. From the time of the onset of mumps his right eye troubled him. His right testicle became swollen early in the disease. Gonorrhea; syphilis and rheumatism were excluded. Upon examination, the right eye was found to be red, and the sclera much injected; the globe was painful on pressure, and the tension was a little increased. For three weeks previous to this examination, weak solutions of atropin had been used. The pupil was irregular, the iris pale and discolored and there were strong posterior synechiæ. The vitreous was cloudy from fine opacities. The fundus was seen with difficulty; it was distinctly hyperemic, and the retinal veins were turgescient. Color perception was normal, and the visual field was diminished. The lacrimal gland was not involved. The iritis was cured, but there remained a marked posterior synechia.

A month later he returned with a typical iritis of the left eye. There was orbital headache, ciliary injection and slight

increase of intra-ocular tension, $V=1/2$. The fundus was slightly hyperemic. There was no hyalitis. There were recent posterior synechiæ. The symptoms cleared slowly under atropin, and he was discharged with all parotid swelling and eye symptoms cured. Vision: O. D., $2/3$; O. S., 1, with difficulty. Posterior synechiæ persisted. The course of the affection was that of subacute iritis; and the deeper layers of the iris appeared to be more seriously involved than the superficial layers.

The author goes into the history of eye affections, due to parotitis, mentioning the various authors who have written on the subject. He states that affections of the iris and uveal tract, due to parotitis, are scarcely known.

The author, in a resumé of this case, calls attention to the fact that in Pechin's case, and in most others reported, the eye condition came on in the subsiding stage, while in his case the condition was one of the first symptoms noted, and recurred in the subsiding stage.

INMAN: *Acute Dacryoadenitis* (Royal London Oph. Hosp. Rep., XV, 4, 1903).

In strong contrast to the extreme rarity usually ascribed to the disease, Inman reports ten cases treated as house patients in the Royal London Ophthalmic Hospital within two years. He recognizes two grades of cases: *one associated with mumps*, usually bilateral, in which suppuration does not occur. The other group is not connected with mumps, commonly unilateral, and suppuration may or may not occur. He reports but a *single case associated with mumps*, and, curiously, in this case, the disease was unilateral, and the lacrimal gland suppurated, although the salivary gland did not. The lacrimal gland was healthy in all cases. The attack begins with stiffness, pain and redness in the outer part of the upper lid, the symptoms increasing rapidly for two or three days. There is marked edema of the ocular conjunctiva to the outer side, with a little catarrhal discharge. The skin of the lid becomes stretched and brawny, and it is impossible to raise the lid voluntarily. Movements of the eyeball, however, are comparatively free in all directions. The general symptoms and rise of temperature are very slight. In only one case, *the one complicating mumps*, did the temperature rise to 100° F. In no case did suppuration extend beyond the gland.

By palpation under general anesthesia, the limits of the swelling can be distinctly outlined, except that it extends backward out of reach when the orbital gland is involved. Whenever abscess formed, the tendency was to point into the conjunctival sac, and not through the skin of the lids. When the abscess opened spontaneously, a thick purulent discharge issued from the conjunctival sac, and there was marked improvement in the pain and swelling.

From orbital cellulitis, acute dacryoadenitis is distinguished by the localization of the tumor in the outer half of the upper lid, the slight pyrexia and general symptoms, and the usual absence of exophthalmos. The more chronic cases might be mistaken for orbital periostitis; but these may be distinguished by the detection of a groove between the orbital margin and the tumor.

The local treatment consists of hot fomentations and, when required, the opening of the abscess through the conjunctiva.

In none of the author's cases could any permanent alteration of the parts be detected; nor was there, either at the time or subsequently, any serious interference with the lacrimal function. If, as seems probable, the gland tissue was extensively destroyed, the conjunctival secretion proved sufficient to serve the purpose, just as it does after extirpation of the gland.

JOLY: *Epidémie d'Oreillons Observée au 94 Régiment d'Infanterie en Mai-Octobre, 1902—Localisations Oculaires* (*Archives de Médecine et Pharmacie*, 1903, XLI, pp. 481-502).

This is an extensive article, dealing with thirty-seven cases of mumps. After discussing the etiology and symptomatology, the author gives a long description of the eye complications, together with the percentage of occurrence in his thirty-seven cases.

He calls attention to the difference between the eye involvements after other acute infectious diseases as compared with parotitis, noting that in the former the changes are, usually, conjunctivitis, keratitis, iritis, etc., while in the latter the condition is usually concerned with the deeper parts of the eye. He states also that in the former, the ocular disturbance comes on early in the disease, while in the latter it usually appears in the subsiding stages.

In his thirty-seven cases the lacrimal gland was invaded

seven times, either by simple swelling or by acute dacryoadenitis.

Functional visual disturbances occurred as follows: Diminution of the acuteness of vision, twelve times; narrowing of the fields of vision, five times; narrowing of the color fields, three times. Lesions, visible with the ophthalmoscope, were observed twenty-four times.

He concludes that the only eye symptom that may help in making an early diagnosis of parotitis is swelling in the region of the lacrimal gland.

VILLARD: *Montpelier Medical*, 18, 1904; *Contribution à l'étude des iritis consécutives aux maladies générales infectieuses*.

With special reference to the ocular complications of mumps, the author says that these are of exceptional occurrence, and usually benign in character. The principal complications are: *Palpebral abscess* (Strzemenski), *swelling of lacrimal gland*, a true dacryoadenitis which might be designated as lacrimal mumps; *optic neuritis*, of which only the cases of Hatry, Talon, Blanchard and Strzemenski are on record; and *retrobulbar neuritis*, a recent case of which was published by Le Roux. *Conjunctivitis* is sometimes observed, more rarely *keratitis*, or *paralysis of accommodation* (Baas and Mandonnet). Cases of iritis are very unusual, and the author found only three cases mentioned in ophthalmic literature: one case of *metastatic irido-cyclitis*, observed by Schiess-Gemuseus, and quoted by Strzemenski; one case of *iritis* observed by Burtreef, and quoted by Dor; and one case of *bilateral iritis*, observed by Pechin. Accordingly, the case reported by the author constitutes the fourth observation on record.

Bilateral Iritis Subsequent to Mumps.—The patient, a woman 30 years of age, in good general health, had an attack of mumps in the early part of December, 1902. Both parotid regions were swollen and very painful. During the last days of the disease, both eyes became reddened and painful. The ocular condition was promptly complicated by the onset of severe periorbital pain. The patient was seen about two days after the beginning of the ocular affection. The two eyes were found to be reddened, the redness being located in the bulb and limited to the circumference of the cornea. This cir-

cle around the cornea, the usual sign of a lesion of the iris, was very plainly marked, and the vessels constituting it formed a very close network. The pupils were narrow, and reacted very sluggishly to very bright light, without as yet being the seat of exudate or irido-capsular adhesions. The iris of both sides did not present the normal glistening appearance. Vision was good. The fundus of the eye seemed to be normal on both sides. The general condition was satisfactory. The parotid glands were no longer swollen or painful. All that remained was a slight swelling of the preauricular ganglion, on the right as well as the left side.

The condition rapidly yielded to treatment (instillation t. i. d. of atropin). At the end of eight days, recovery was complete and permanent, without resulting anatomical or physiological disturbances.

DEVEZE AND SARRADON: *Relation de deux epidémies d'oreillons, particularités cliniques et complications (Tribune Médicale, 1906, N. S., pp. 21-37).*

The authors describe two epidemics of mumps, occurring among the garrison at Montpellier. They observed personally 280 cases among the soldiers, and three among the civilians.

In the epidemic of 1903, twenty-seven cases of catarrhal conjunctivitis were noted, one of which was accompanied by a severe dacryo-cystitis, lasting ten days and recovering completely.

There was also one case of amblyopia, described as follows:

A soldier of Engineers was admitted, February 15th, with swelling of the left parotid and submaxillary regions, slight fever, sore throat and constipation. Urine was negative. On February 21st the general symptoms were much improved. The patient complained of dimness of vision, being unable to read his paper. He could read the numerals of his watch with extreme difficulty. The only changes noted in the eyes were hyperemia of the bulbar conjunctiva and lacrimation. Lens negative. The patient improved rapidly, and was discharged cured, on the 8th of March.

Ophthalmoscopic examinations were not made in any of the cases observed by the authors.

In the epidemic of 1905, two cases of catarrhal conjunctivitis only were noted.

In a resumé of their cases, they note that in nearly all cases

of mumps in which the eyes were involved, the symptoms came on as the swelling had nearly subsided. They state their belief that all eye complications of mumps are not severe, and that eye complications rarely last over fifteen days.

Authors Who Have Contributed Important Papers on the Subject, but Who Have Not Reported Personal Observations.

BERGER: *Oreillons (Les Maladies des Yeux dans leurs Rapports avec la Pathologie Generale*, 1892, p. 315).

He cites the case of paralysis of the accommodation due to mumps, described by Baas (*Klinische Monatsblatt für Augenheilkunde*, July, 1886.) He refers to the spurious cases of mumps of the lacrimal glands, described by Hirschberg (*Centralblatt für praktische Augenheilkunde*, 1890, p. 77). Reference to Hirschberg's article will disclose the fact that there was no reason to suppose that his patients had mumps. The title "Mumps der Thränen Drüsen" was a fanciful misnomer.

Berger cites Talon's case also.

WALTER: *Mumps der Thränen Drüsen (Die ophthalm, Klinik., III., 1899).*

Inflammation of the lacrimal gland in mumps is as a rule bilateral, but in exceptional cases it may be unilateral. It generally appears a few days after the parotid swelling, but may precede it, so that the swelling of the lacrimal gland is the initial sign of beginning parotitis. The eyelids may be so markedly edematous that the lacrimal gland cannot be palpated, notwithstanding its enlargement.

FUCHS: *Gleichzeitige Erkrankung der Thränen Drüsen und der Parotiden (Beitrag. z. Augenheilk., 3, 1891).*

Bilateral invasion of the lacrimal gland manifests itself independently, as an acute or a chronic swelling. Acute swelling of the lacrimal gland and the parotids is observed in parotitis. Chronic swelling of the lacrimal and various salivary glands is caused by lymphoma or lymphosarcoma, and may likewise occur as the result of swelling of the lymphatic glands of the head and neck.

ANTONELLI: *Les Névrites Optiques au Cours des Infections Aigües (Archives d'Ophtalmologie, 1903, p. 578, et seq.).*

An elaborate essay read before the International Congress at Madrid, but on the subject of parotitis the author has com-

paratively little to say. He remarks that eighteen cases of optic neuritis, due to mumps, have been reported up to that time. In most of these, cure resulted, and termination in complete atrophy is rare.

FRANKENHEIM: "*Concerning Epidemic Parotitis*" (*Deutsche Klinik, Berlin u. Wien*, 1904).

In an extended article the author deals with the subject in a general way. He mentions the symptoms and complications that may occur. He states that cases of conjunctivitis, iritis, keratitis, retinitis, neuritis with amaurosis, have been reported, but gives no details.

SNELL: *Acute Dacryoadenitis* (*Ophthalmology*, Vol. I, 1904-5).

In a search through the literature of ophthalmology, covering a period of one hundred years, the author found one hundred and thirty-six cases of acute dacryoadenitis. Of the seventy-seven cases in which the etiology was determined or suggested, *fourteen were associated with true mumps*. The total one hundred and thirty-six cases include five cases from the American literature. The earliest of these are two cases reported by Dr. Charles E. Rider to the N. Y. State Med. Society, in 1872. These two cases were caused by *mumps*, and Dr. Rider should be credited with being the first physician to observe a case thus caused.

GROENOUW: *Erkrankung der Speicheldrüsen [Mumps]* (*Graefe-Sacmisch Handbuch der Augenheilkunde*, 2, Auflage, XI Band., S. 73, 1904).

The author gives a brief, though satisfactory, review of the salient features of the subject, with specific references to many of the more important reported cases. He mentions the theories advanced to explain the pathogenesis of the optic nerve complications, namely: Hatry's theory of compression of the vessels of the neck by the swollen parotids causing stasis in the orbital vessels; Talon's theory that, in his case, the optic neuritis was dependent upon an intracranial lesion; and Dor's toxin theory, which is worthy of especial attention, inasmuch as complications in the visual apparatus are most frequent after the usual course of mumps has been run. The onset of the complications of diphtheria is analogous: infectious diseases require a certain time in order to saturate the system with the toxins.

BERGER: *Considerations generales sur la pathologie oculaire* (*Encyclopédie Française d' Ophtalmologie*, Tome 4, 1904. *Maladies bacteriennes: oreillons*, pp. 168-169).

The author devotes a single paragraph to the subject, stating that conjunctivitis, mydriasis, paralysis of the accommodation, amblyopia with optic neuritis, exceptionally terminating in optic nerve atrophy, congestion of the retina, and paralysis of the extra-ocular muscles, occurring as a rule at the conclusion of the malady, and due to the influence of toxins, may characterize some epidemics of mumps. Bilateral dacryoadenitis especially, is observed either early or late in the malady, and the author says "it seems that sub-acute dacryoadenitis without parotitis may be the only manifestation of mumps," and gives Hirschberg as authority for the idea.

Inasmuch as the conception of the facts is incorrect, and as other writers on this subject (Von Schroeder, Sendral) have referred to Hirschberg's cases in a misleading way. I append an abstract of them although they are not strictly pertinent to the subject.

HIRSCHBERG: *Mumps der Thränendrüsen* (*Centralblatt für praktische Augenheilkunde*, 1890, pp. 77-78).

(A) Chronic inflammation of the lacrimal glands is not so very rare; but it is usually a consequence of prolonged keratitis with lacrimation. A reddish tongue-like tumor with a nodular surface is found between the upper lid and the eyeball in the temporal angle when the patient looks downward, while the surgeon raises the upper eyelid. It is rather a tumefaction than an inflammation of the lacrimal gland.

(B) Acute inflammation of the lacrimal glands is very rare. Suppurative acute dacryoadenitis is described, cases of which the author had seen.

(C) Bilateral sub-acute, non-suppurative dacryoadenitis is very rare. Its chief symptom is disfigurement of the face, for which reason the author had described it as *Mumps der Thränendrüsen*, in 1879. (*Jahresbericht von 1878, in Knapp's Arch.* 1879 no. 21.)

(1) The first patient, a healthy girl, fifteen years of age, was sent to him October 18, 1878. There was bilateral swelling and reddening of the upper lid, without swelling or secretion of the conjunctiva, a flattened projection, tender on pressure, was palpable on both sides in the region of the lacrimal

gland. On the following day, the palpebral swelling had increased, and the bulbar conjunctiva in the temporal angle was somewhat swollen. On both sides, behind the middle and the temporal end of the upper orbital margin, an elastic slightly roughened swelling was palpable, so that the presence of the dacryoadenitis could not be doubted:

The treatment consisted in warm compresses and potassium iodide. Three days later the swelling of the bulbar conjunctiva had involved a reddened fold covering the upper half of the cornea from above. Fluctuation could not be detected. On the following day the swelling began to subside. By the end of a week, the swelling in the left side was barely noticeable; on the right side, a tongue-shaped tumor could be felt, which became plainly visible as a red, nodular mass between the eyelids and the eyeball, when the patient looked down while the lid was raised. At the end of another week the right eyeball was depressed, and upward version of it was restricted, resulting in a corresponding diplopia. Six weeks later she had recovered completely.

(2) His second patient, a girl seventeen and one-half years of age, in good general health was seen on the 29th of January, 1890. She presented a marked swelling of the temporal half of the upper eyelids. The upper eyelids were somewhat reddened, but the eye itself remained white. Over both eyes a tense, elastic swelling was plainly felt behind the bony rim of the temporal half of the supraorbital margin. It was somewhat tender to pressure. As the patient turned her eyes downward while the upper lid was raised, the anterior reddened portion of the lacrimal gland could be seen projecting from above forward and downward over the lateral half of the bulbar conjunctiva. The condition improved under lukewarm compresses, and potassium iodide, but was still quite marked at the end of a month.

58 West Fortieth Street.

A CASE OF BILATERAL METASTATIC OPHTHALMITIS IN PUERPERAL PYEMIA. RECOVERY OF THE PATIENT.

G. E. DE SCHWEINITZ, M. D.,
PHILADELPHIA.

The high mortality of bilateral puerperal metastatic ophthalmitis is well known, and reaches, according to Axenfeld, 85 per cent., which Groenouw, however, thinks is too low a figure. Indeed, some writers maintain that puerperal pyemia with metastatic ophthalmitis of both eyes is always fatal. The following case, therefore, seems worthy of record:

A Russian woman, aged 28, was admitted to the Philadelphia General Hospital on the 10th of November, 1905, and gave the following history: She has been a resident of the United States for seven years, has been married one year and is the mother of one child. Prior to the illness which occasioned her admission to the hospital her health had been good. There was no evidence of syphilis, her habits have been correct, and the family history is excellent, her father, four brothers and four sisters being alive and in good health. Her mother died at the age of seventy-five.

Nine days before her admission, the patient gave birth to a healthy child, and was properly attended by a physician in good standing. Five days after the birth of the child, the patient's eyes became inflamed, whether both at the same time, or one shortly after the other, is not certain. Preceding the ocular inflammation, and associated with it, there were fever and violent headache. The eyes were treated at first by some drops, the nature of which is not known, and subsequently she seems to have fallen into the hands of an irregular practitioner, who promised to cure her eyes with electricity. Whether electricity was actually applied or not is not known. Subsequently Dr. Kearney was summoned, who at once recognized the serious condition of affairs and urged her admission to a hospital. She was taken to the University Hospital and brought to my ward, where, at the time, it was impossible to

keep her, and therefore she was transferred to the Philadelphia General Hospital on the day already named.

EXAMINATION.—The patient was a thin woman, of medium height. She was stuporous, although not actually unconscious. The temperature was 96 degrees F., the pulse 92, and the respiration 20. The tongue was dry and covered with a thick brownish fur, the lips were parched and peeling, and well marked where the teeth, which were covered with sordes, had pressed against them. The breath was foul. On the lower lips were a number of small sores resembling the so-called fever blisters. The chest expansion was fair. The breasts were fairly well developed, but not engorged. The right breast was tender on pressure. There was no pulmonary complication. The heart sounds were clear and no murmurs could be detected. On the inner side of each knee there was an uncrusted lesion about one and one-half inches in diameter, which was believed to have been caused by a hot water can. The vaginal examination revealed a thin, yellowish discharge, a relaxed perineum, and a soft, easily dilated cervix. The uterus was enlarged and in its normal anteflexed condition.

OCULAR EXAMINATION, R. E.—There was intense injection of the sclera, which assumed a purplish tinge. The entire cornea was grayish-white in color, and midway between its center and periphery there was an almost circular yellowish-white infiltration, 2 mm. in width, and about 1.5 mm. from the limbus, in all respects answering to the description of the so-called *annular infiltration*, or *ring abscess*. A thin purulent discharge bathed the conjunctiva.

L. E.—The appearances were similar to those of the right eye, except that the pus was more free and thicker, and the ring abscess of whiter color and better developed. A perforation had taken place at the upper corneo-scleral junction, from which some discolored vitreous was protruding.

Examination of the purulent secretion from the eyes, both by culture and smears, revealed the presence in great quantities of the streptococcus pyogenes and a few undetermined micrococci. Repeated examinations failed to find gonococci.

The urine had a specific gravity of 1010 and 1005, contained neither albumin nor sugar, but on microscopic examination, many leucocytes, some uric acid crystals and epithelial debris.

The blood analysis was as follows: Red blood corpuscles, 4,572,000; white blood corpuscles, 37,500; polymorphonu-

clears, 91 per cent; lymphocytes, 4 per cent; eosinophiles, 1 per cent. The blood culture was sterile.

On the evening of the following day the uterus was curetted and from it were removed a number of small blood clots, and a considerable amount of yellowish-white secretion and exudate, which was not, however, excessively foul, but which contained streptococci.

Two days later, the patient's condition continuing to be exceedingly unfavorable owing to excessive vomiting and inability to retain nutrition except by enemas, an abscess began to form in the left rectal space. This was opened and discharged an offensive pus which contained pneumococci, staphylococci and colon bacilli.

Four days later there was some improvement in the patient's strength, and the temperature, which had ranged between 99 and 100 degrees F., became about normal, and vomiting was less frequent. On the following day all of the signs of violent panophthalmitis were present in the left eyeball, which were somewhat lessened by an incision, but which, for their entire relief required an evisceration four days later. From the pus in the eye an almost pure streptococcus culture was obtained. Following this operation the patient's condition greatly improved and the vomiting ceased.

On the 1st of December, or twenty days after her admission, panophthalmitis appeared in the right eye, which, however, subsided after spontaneous rupture aided with hot compresses. Improvement continued until the 16th of December, when pain began on the anterior surface of the left elbow joint, and two days later an abscess formed which was evacuated; the pus contained streptococci. Following this operation improvement was uninterrupted, no more vomiting occurred, food was taken readily, and the patient was discharged on the 23rd of December, totally blind, but in fair general condition.

The interesting features of this case evidently are a puerperal septicemia, followed within four days after its appearance by an annular abscess of each cornea, and later by panophthalmitis. In all probability the focus of infection in this case was an abrasion in the uterine mucous membrane, and the bacteria were transmitted to the anterior portion of the uveal tract, where they set up an irido-cyclitis, followed by a keratitis which attacked the cornea from behind, and thus

there came about the ring infiltration which was evident by inspection, owing to an emigration of leucocytes from the peripheral vessels. Subsequently there was a general infection, as is almost always the case, of the coats of the eye, or in other words, panophthalmitis.

Although so-called peripheral annular infiltration or ring abscess of the cornea usually results from perforating injuries or operations, it may also occur, according to Parsons,¹ after spontaneous perforation of an ulcer, and in metastatic ophthalmitis. The recovery of this patient from a severe puerperal pyemia, associated with bilateral metastatic ophthalmitis and abscess formation in the arm and rectal space, represents a result which is unusual, and which is therefore recorded.

1705 Walnut St.

¹The Pathology of the Eye, Vol. 1, p. 217.

FUNDUS LESIONS WITH NORMAL VISION.*

J. F. BURKHOLDER, M. D.

CHICAGO, ILL.

For the past year and a half it has been my custom to make a colored drawing of all fundi that presented anything peculiar or unusual. Early in my study of ophthalmology I realized the fact, that one could not learn fundus diseases from an atlas, or by hastily looking at occasional fundi as they presented themselves in the office, or at a clinic. In this connection, as well as in the study of any anatomical structure, whether normal or diseased, it is well to put down on paper what one sees; and to remember that every case seen by the beginner ought to be studied with the same care that must be pursued in the investigation of any intricate structure. It is only by such painstaking research that a novice can hope to attain the proficiency of an accomplished ophthalmologist, in anything less than a lifetime.

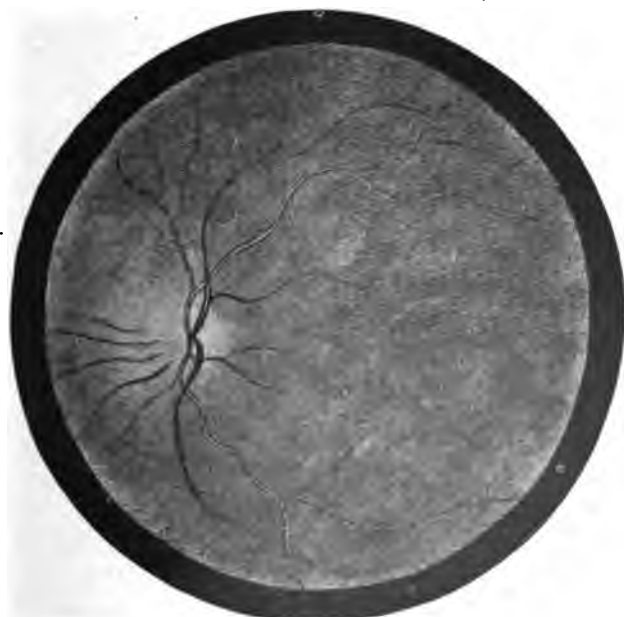
It is a startling fact, that relatively enormous derangements of the fundus can exist, and yet the unfortunate individual be in the possession of remarkably good vision, and altogether unconscious that there is anything wrong. All ophthalmic surgeons have a number of such cases, would they but take the trouble to investigate them. A novice, however, does not know this, and is inclined to assume that so long as the patient can read 20/20, there cannot be grave fundus disturbance. This is a fatal complacency that ought to be shaken at the earliest possible moment.

There is only a modicum of literature in textbook or journal on this subject. About the only condition that is mentioned is choked disk, and in describing it most authors note that despite the very marked fundus changes frequently found, vision may be normal. Beyond this statement, however, the student must infer or learn from his personal experience. This surely is not as it ought to be. Some of these cases are of serious moment to the student of ophthalmic science, for to him only

*Read before the Chicago Ophthalmological Society, October 9th, 1906.



Case I.—a.



Case I.—b.

Miss W., age 19. Under observation for three years. When first seen a diagnosis of papillitis was made: it is now thought to be a case of pseudo-papillitis.



Case II.—a.

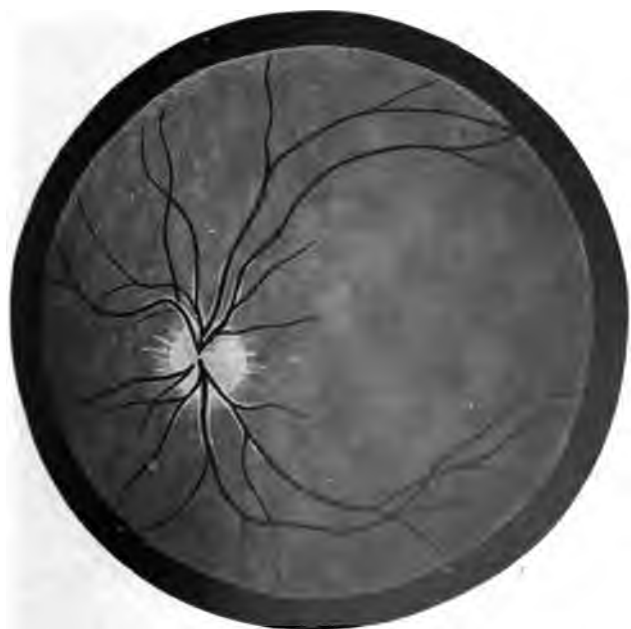


Case II.—b.

Mrs. H., age 30. Under observation two years, first diagnosis was choked disk with probable brain tumor. It is now looked upon as a case of normal fundus with an interrogation mark. Vision has always been normal.



Case III.—a.



Case III.—b.

Mr. D., age 27. Ten years ago had meningitis.





Case IV.—a.

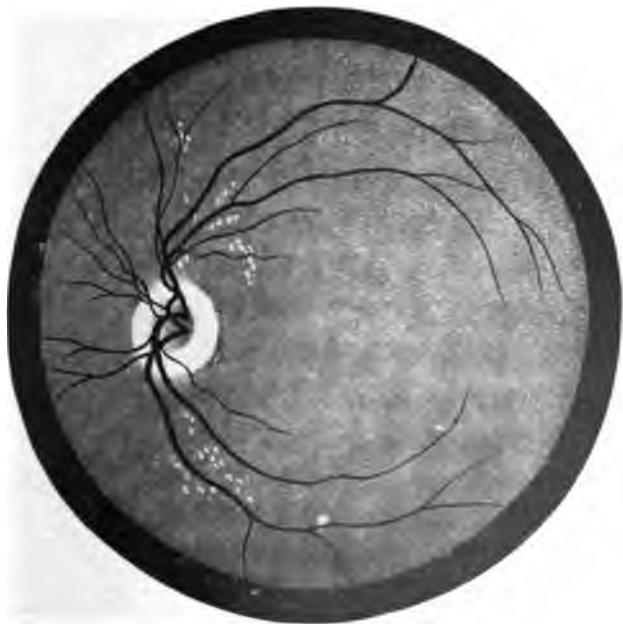


Case IV.—b.

Mrs. A., age 56. Papillitis, under observation one year. Disk now looks practically normal. Vision 20/20.



Case V.—a.



Case V.—b.

Mrs. F., age 60. Chorioidal exudate. Has had very severe attacks of dizziness and headache since April, 1906. Vision with correction normal.

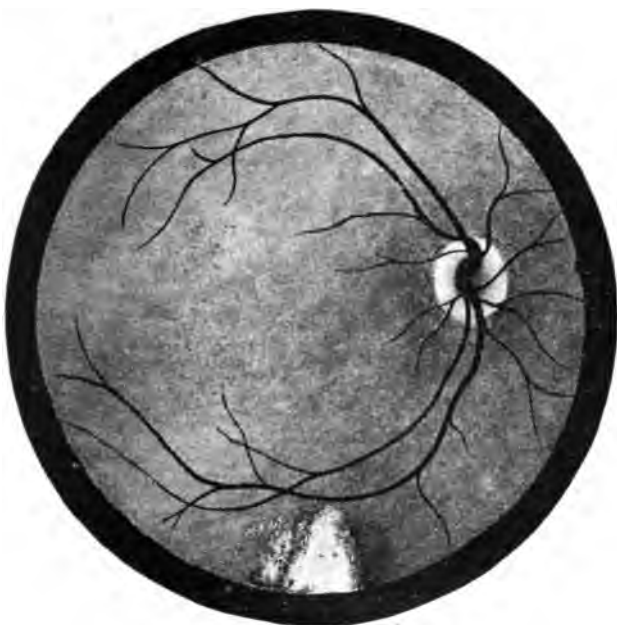




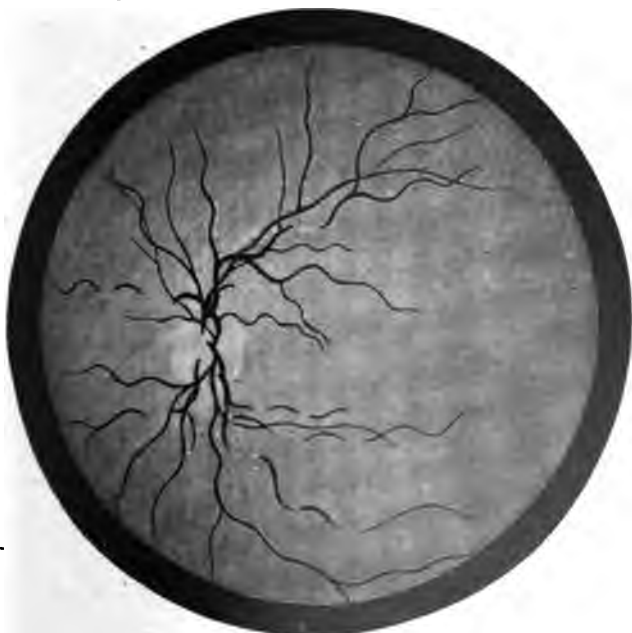
Case VI.
Mrs. W., age 27. Specific Chorio-retinitis. Corrected vision
each eye 20/20.



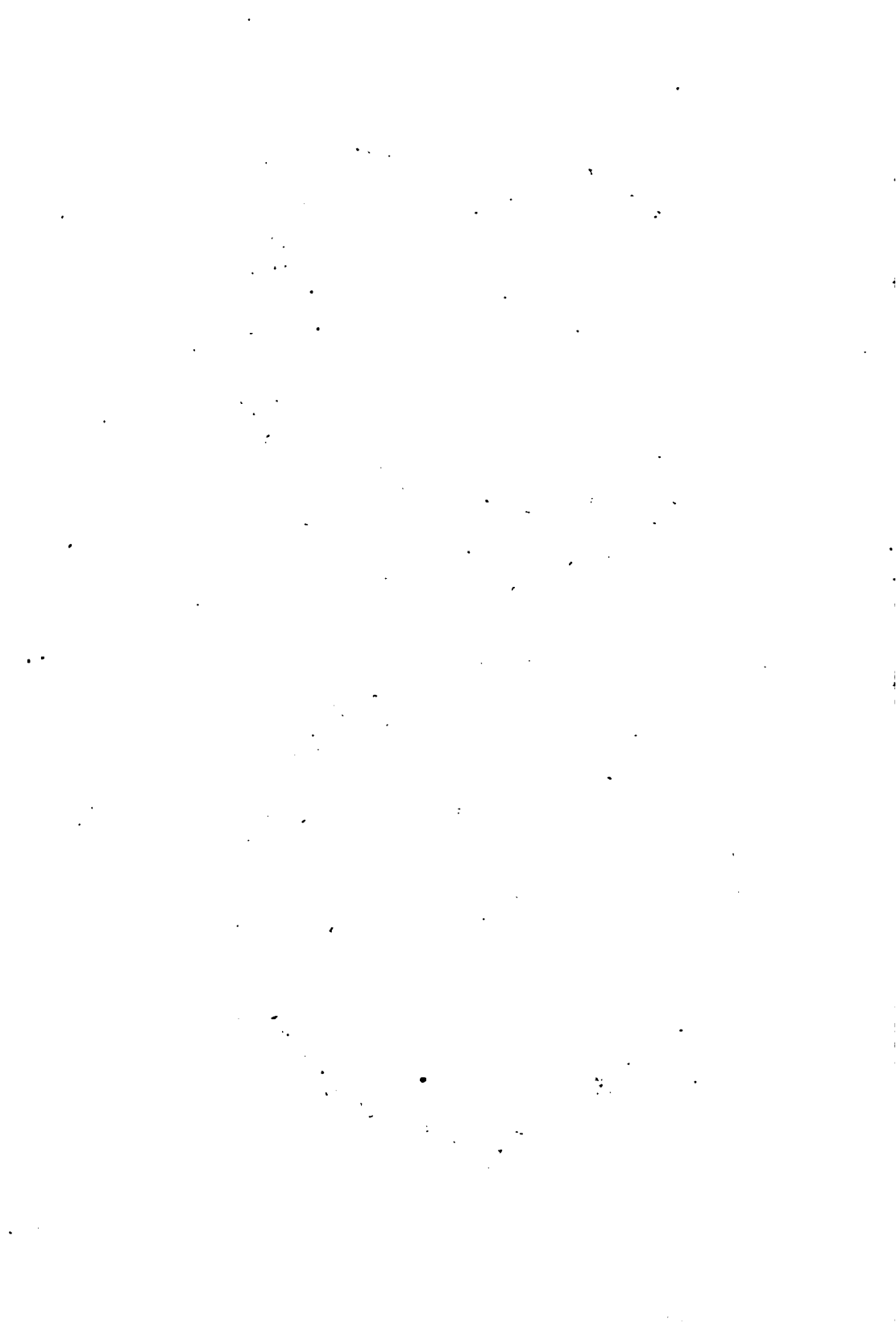
Case VII.
Mrs. P., age 50. Hemorrhages in the retina. Father and
aunt afflicted in the same manner at about the same age;
vision is normal.



Case VIII.
 Mr. B., age 35. Chorioiditis. Vision normal with correction.



Case IX.
 Mr. R., age 25. Russian Jew. Retinitis. Vision is 6/5 in each eye.





Case X.

Mr. B., age 21. Single. Retinitis, with a specific history.
Vision normal.



Case XI.

Miss H., age 24. Leukemic retinitis without hemorrhages.
Vision normal with correction.



Case XII.
Miss S., age 24. Edema of the retina. Corrected V. Normal.

is the full force of the necessity of a decisive and correct diagnosis brought home with stunning effect. It is to be regretted that modern standard works on diseases of the eye pay so little attention to the borderline in ophthalmology between pathological and normal condition: what is disease and what is not.

Every book or atlas on the diseases of the eye devotes a few words, and a plate or two to the diversities found in the normal fundus. They instance the brunette and the blonde, the albino and the negro, but few go further. From the standpoint of the student this is altogether too meagre. Assuredly all realize that the only place to *study* fundus disease is in the dark room, but such study ought to be conducted with a care and thoroughness that is not always found. But none will venture the assurance that in such investigations we can get along without text books and journals, and any assistance that will aid us in developing diagnostic skill ought to be heartily welcomed.

I have taken this occasion to present for your consideration seventeen drawings of fundi from cases in which the vision was normal or better, and where in the majority of instances there was unmistakable evidence of disease. These cases occurred in the practices of Doctors Fisher, Faith, Frank and myself.

Because papillitis is invariably mentioned as the disease *par excellence*, in which there may be marked organic changes accompanied by normal vision, I thought it expedient to pay my respects to tradition, and show a few drawings of choked disk, genuine or otherwise as the case may be.

CASE I. (Figs. a and b) Miss W., age 19, was seen for the first time early in 1903. An optician had supplied her with glasses for near vision in 1898. In the month of March, 1899, she began to have headaches, first on the right side, and then on the left. These headaches were always preceded by a scintillating scotoma lasting from five to ten minutes; the headaches which followed would last from a few hours to several days. These conditions were gradually getting worse. She was wearing at the time —3. D. S. each eye. Personal history good, except for an attack of hysteria in 1903, which lasted twenty-six to twenty-eight hours, and leucorrhea and dysmenorrhea of long standing. Examination of the blood and urine

was negative, except that she had polyuria. No dyscrasia. Fields normal for form; colors overlap, particularly in the horizontal meridian; refraction O. D.—3.25, D. S.; 6/5, O. S.—3.50 D. S.; 6/5. The veins were large and somewhat tortuous, while the region of the disk presented the appearance of a beginning papillitis.

Treatment: Iodide of potassium to saturation; no improvement. Ung. hydrarg. 50% to the limit of toleration; no improvement. Turkish baths once a week, with $\frac{1}{2}$ oz. sulphate of magnesium every morning without benefit. Some of you perhaps will remember this case, which was shown at the time before this Society. The fields were taken again and found normal except for slight color overlapping in the horizontal meridian. Examinations were subsequently made in 1904, 1905 and 1906, the vision and fields remaining unchanged. The papilla was elevated 3 to 4 D. above rest of the fundus, and at places the vessels were covered by some material that was thought possibly might be exudate. The dysmenorrhea is at the present time considerably improved, and the migraine less severe, and the attacks not so frequent.

CASE II. (Figs. a and b) is one of considerable interest, and one that several members of this Society have seen. Mrs. H., age 30, seen in July, 1905. Family and personal history negative; had always been of a markedly optimistic temperament; was the wife of a physician. Two years prior to my first observation, disturbed mental conditions bordering on melancholia made their appearance,, accompanied by extremely severe headaches variously located. In the summer of 1904, two neurologists of Chicago made a diagnosis of probable brain tumor, and asked for examination of the fundi. Conditions showed what might be called early stages of choked disk; the margins of the disk were invisible, and a hazy condition seemed to radiate from the cup. There was little or no elevation above surrounding tissue. Vessels not tortuous, veins perhaps somewhat enlarged; no hemorrhages, and no material that could with certainty be called exudate. The fields, which were taken several times, indicated hysteria. Five ophthalmologists saw the case; two made a diagnosis of hysteria with pseudo-papillitis, and three pronounced it genuine choked disk. A vigorous treatment with iodide was advised, combined with cannabis indica. In October the patient was re-

ported well; headaches gone, and vision as it had always been, was 20/20; she had regained her optimism. I wrote the doctor to offer my congratulations, and incidentally advised him to vary the treatment to see if the cannabis indica were not masking symptoms. In November he writes, that notwithstanding an increase in the drug, the old symptoms have returned. The veins were at least twice the size of the arteries, while the vessels at the disk appeared to be deeply covered by exudate; there were no hemorrhages that the doctor could discern. In July of this year the patient is reported very much better.

I consider cases I and II very instructive, and they suggest the possibility to the younger votaries of the ophthalmoscope, that a diagnosis of even papillitis is not always the very simple thing that most books and teachers would lead one to suppose, and that an extensive knowledge of neurology ought to be a part of the intellectual armamentarium of every ophthalmologist, for as Ranny said years ago, the retina is only a portion of the brain pushed out from the encephalon, and included in accessory parts. The anatomical, physiological and pathological relationships are so intimate, that in many instances one dare not separate them when it comes to a matter of diagnosis.

CASE III. (Figs. a and b) also presents points of interest, particularly in reference to etiology and diagnosis. Mr. D., age 27, single, came to have his eyes examined for glasses to relieve him from almost constant headaches; otherwise he is perfectly well so far as he knows. Refraction under homatropin revealed a very slight error, and with his correction he reads 20/15. On examining the fundi, distinct white lines were noted on each side of the vessels. This condition began in the disk and extended for some distance beyond; there was also a quantity of the same material in the disk arranged in the form of striations radiating from the center, and also extending for some distance beyond. Could get no trace of the lamina cribrosa. The drawings show conditions with tolerable accuracy. On first examination I was inclined to consider the condition one of abnormal connective tissue peculiarly arranged, and where the adventitia was abnormally thick, but not of inflammatory origin. The personal history, however, would indicate that the existing condition was the result of

pathological changes. Ten years ago he had an attack of meningitis, said to be spinal in character; it was accompanied by distressing photophobia. He was kept in a dark room for two weeks and could not use his eyes for near work. The fields show concentric contraction for colors that strongly suggests atrophy. The form fields are normal; there is a slight crossing of the red and green boundaries in one meridian O. D. The patient is not well at the present time, either mentally or physically.

CASE IV. (Figs. a and b.) Mrs. A., age 56, is not one of unusual interest, as it is a typical papillitis as shown by the drawings. Personal and family history are good. She complained of a little cloudiness in her right eye, with some pain and photophobia. There was slight injection of the pericorneal region, and considerable lacrimation when doing near work. Though married thirty-six years, she had had no miscarriages or children; had always been healthy; no history of syphilis. A year before I saw her, she began to have attacks of headache with dizziness; at these times the skin would become bad in color. Urine negative. Drawing (a) shows condition of the right fundus the second time I saw her, Sept. 21, 1905. Veins were tortuous and enlarged, no hemorrhages, and little or no elevation; there was considerable exudate. Figure (b) shows condition one week later. Vision was normal at all times during the period she was under observation. Two years before this she had had a similar attack in the left eye, the fundus of which now shows optic atrophy with 20/40 vision. In six weeks' time the fundus O. D. appeared almost normal, the exudate had disappeared, the vessels had almost entirely lost their tortuosity, and the disk margins were plainly visible.

CASE V. (Figs. a and b.) Mrs. F., well nourished old lady of sixty. Always considered herself very healthy. About ten years ago she began to have attacks of dizziness which were followed by severe headaches; these were attributed to biliousness, and little attention was paid to them. Since April of last year these attacks have been more severe, and show no signs of abatement. They are not influenced by reading or sewing. Her vision with correction is normal in each eye; the fundi are clear, except for a small amount of choroiditis shown in the drawing. The lesions are not very extensive,

yet there is no question as to their pathological nature. Whether these changes are new or old is a matter that is rather difficult to decide; and whether the constitutional dyscrasia that causes the dizziness has caused the chorioidal changes is likewise hard to determine.

CASE VI. Mrs. W., age 27, is to my mind a very remarkable instance of good vision where there are extensive fundus changes, and serves to impress one, that very serious and acute fundus lesions with normal vision do exist. In December of last year this patient had an attack of eye trouble, and at that time a diagnosis of iritis was made. Since that time she claims that her vision has been dim. She was specifically infected in October, 1905. She now has a chorio-retinitis in both eyes, has very little pain, and none at night. There is no evidence of implication of the cornea, iris or conjunctiva. Urine, 123 ozs. in 24 hours; sp. gr. 1004, urea .5%; traces of indican; otherwise negative. The blood showed hemoglobin 60%, r, b, c, 4,200,000. The patient gives a history of chlorosis. Treatment by mercury and iodine to the limit of toleration resulted in no marked improvement; this was followed with iron, arsenic and strychnia, with great benefit. Refraction under atropin showed compound hyperopic astigmatism each eye. Corrected vision each eye was 20/20.

CASE VII is one of interest to the ophthalmologist on account of the family history. Mrs. P., age 50, seen April 23, 1906. She complained of some blurring before the right eye in distant vision, which at times was worse. Duration of symptom was several weeks. Near vision was undisturbed with reading glasses, her distant vision, however, remained slightly indistinct even with correction. The vision O. D. with +2 D. S. was normal. Personal history was negative. Her father lost the sight of his right eye suddenly at the age of 55. No external evidence of disease was visible: he died at the age of 65 with kidney and heart disease. Father's sister was afflicted in both eyes at about her 55th year, and was practically blind for the remainder of her life, dying at the age of 80. Patient's mother was seized with an attack of paralysis of her right side when she was 80; this was nine years ago; a serious attack followed recently, and she is now completely helpless. The drawing illustrates the condition of the patient's fundus at her second visit. The acuity of vision

is the same now as when first seen, in fact she says her sight is constantly improving. The conditions in the eye, nevertheless, are worse, the hemorrhages are more numerous and larger; some day there will be cataclysm.

CASE VIII. Mr. B., age 35, married, seen March 30th, 1906; no children. Five years ago was examined in Denver for glasses and given +1. D. S. \ominus +.50 D. C. Ax. 90° for each eye; this correction was worn until July, 1905, when he was examined in Buffalo, and given O. D. + 2.50 D. S. \ominus + .50 D. C. ax. 75° ; O. S. + 2.75 D. S. \ominus + .25 D. C. ax. 105° , which correction he could not wear for distance. Five years ago, about one week after first glasses were obtained, he was duck shooting, and noticed black spots before O. D. There was no mention of pathological conditions at the time of examination. Present vision is 5/5 in each eye with correction. About three disk diameters to the temporal side, and a little above, is a pigmented patch of chorioiditis. Below and about the same distance to the temporal side is a larger area of old chorioiditis. The region of the macula is somewhat granular.

CASE IX. G. R., age 25, a Russian Jew. He had been complaining of headaches and pain in the eyes. Four months before consultation, had a severe attack of quinsy. Vision in each eye was 6/5. Fundus and media clear, vessels tortuous and covered at places by apparent exudate. Refraction under atropin, emmetropic in each eye. Fields were normal. Urine negative. Blood:—Hemaglobin 70%, r. b. c. 4,649,000, w. b. c. 7,000. Has pulsating arteries and an old aortic lesion.

CASE X. F. W. B., age 21, single, has a specific history, with primary sore and rash. Was under treatment for two years. Two years ago had an attack of iritis. In December, 1905, had inflammation in O. S. which lasted for three or four weeks; was under the care of an oculist. Floaters and chorioidal exudates O. S. Examination showed a peculiar exudate in the papillomacular region, suggestive of albuminuria. The urine, however, was negative. There was no adenitis. Patient was anemic, and improved greatly on iron and strychnia. Corrected vision was 6/6 each eye. The vision later became reduced to 6/9, but at the time the drawing was made was normal.

CASE XI. Miss H., age 24, seen August 25, 1905. Family

history negative. Had nervous prostration in July, 1904, followed by tinnitus, which has continued in the right ear. Has had splenic leukemia for one year and four months; has improved much under the treatment. At the present time the spleen is only slightly enlarged. Blood examination made August 21, 1905, showed hemoglobin 78%, r. b. c. 4,160,000, w. b. c. 120,000. The retinal veins are very tortuous and considerably enlarged, both eyes. There was no exudate O. S., but in the papillo-macular region of O. D. was seen a considerable quantity, yellow in color. There were no signs of hemorrhage in either fundus, which is remarkable when it is remembered that most authorities consider this a hemorrhagic disease so far as the fundus is concerned, and they invariably note the presence of blood in the retina.

CASE XII. Miss S., age 24. Seen in September, 1905. Had constant sick headaches from the time she entered school. About ten years ago she noticed that at times her vision became blurred in both eyes. This blurring was followed by headache, which was occasionally accompanied with vomiting. The blurring would last from fifteen minutes to a whole day. Would sometimes be dizzy and light headed. Habitually constipated. Appetite good. Had eczema in the winter of 1904-5, and measles when five years old. Has had attacks of sub-acute rheumatism. Vision under homatropin with + .75 D. S. was normal, each eye. The fundus condition is one of edema of the retina, with the lower portion of the temporal region as the focus of disturbance. The condition rapidly subsided, and the eye was quite normal within a week.

These cases are not supposed to represent anything new or startling. The experienced surgeon has seen them all many times, but when one finds such diverse fundus lesions accompanied by normal vision, is there anything unreasonable in the contention, that everything pertaining to the refraction of the eye should be done, only by physicians who are thoroughly capable of making an intelligent examination of the fundus?

The opinion is quite universal, that any one with very little preparation is capable of fitting glasses. The medical profession itself is far from being innocent of this heresy. The timely discovery of these conditions by a capable and conscientious ophthalmologist may, if they be amenable to treatment,

add many years of life and comfort to the patient; but what possible chance has such a case in the hands of a druggist or of an optician? The fitting of glasses is just as much the practice of medicine as writing a prescription for Epsom salts or morphia, which all agree ought not to be done without due investigation, and then only by duly qualified persons.

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SOME UNUSUAL OCULAR MANIFESTATIONS OF GONORRHEA.*

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About a year ago there came under my care a young man, nineteen years of age, for an affection of his eyes which has presented so many features that were unusual, that I have been instigated to detail them at length. All might be attributed to a systemic poisoning of gonococci, for during the entire period of the ocular inflammation, and indeed at the present time, the patient has suffered severely from general complications arising from a local urethritis.

The first manifestation of what has since proved to be a long sequence of varied ocular inflammations, began in December, 1905, when I was consulted upon account of what was supposed at the time to be a mild sub-acute conjunctivitis, the conjunctiva being but little injected, except at the region of the inner canthi of both eyes, where the mucous membrane was red and somewhat swollen. There was but little secretion, and no bacteriological examination was made. A zinc wash was prescribed and the patient was asked to report if the symptoms did not subside in a few days.

Four days later, however, the patient's family physician summoned me in haste, with the communication that gonorrheal ophthalmia had developed in both eyes. He informed me, too, of what I had been ignorant of before, that the lad had had an urethral discharge for some weeks, and stated that he was satisfied that the ocular inflammation had come from that source, since he had discovered gonococci in the conjunctival discharge.

At the examination which was made shortly afterwards, I discovered that the four intervening days had changed the clinical features very greatly, and there was now no difficulty in substantiating the diagnosis of gonorrheal conjunctivitis which had been made by his physician, from the appearance of

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, November 20, 1906.

the eye alone, for the lids were swollen and the conjunctiva was much injected, and was secreting a thick glary mucopurulent discharge. The corneae were uninvolved. Active anti-purulent conjunctival treatment was at once instituted, consisting of frequent cleansing with a solution of boracic acid, of daily applications of nitrate of silver, of instillations of atropin, and the constant application of ice. Despite these measures, however, the inflammation still persisted, though the symptoms of great severity which are usual in cases of adult gonorrheal conjunctivitis failed to develop, for the lids, though puffed, were not extremely swollen, and the bulbar conjunctiva was never very edematous. Gonococci were found plentifully in all smears. There was but little pain. For the first few days the symptoms were much more marked in the left eye, but at the end of this time, the right became similarly affected.

The urethritis at this time was subsiding, but the bladder was involved and the urine was laden with pus. Several of the joints became swollen and painful, and the patient's condition was most pitiful. Although the progress of the ocular inflammation was favorable, a slight relapse made further advice desirable, and Dr. deSchweinitz saw the case with me. At the consultation, the mild character of the inflammation was dwelt upon, and upon account of the severe joint involvement, it was thought likely that the conjunctivitis had not resulted from direct infection, but was rather of metastatic origin. A continuance of the local treatment was advised and the attending physician was requested to push the salicylates and other systemic treatment.

After two weeks of active measures, the eyes had almost entirely regained their normal appearance, and the general physical condition had much improved, though the patient was still confined to bed, upon account of the general toxemia. Great care was still given the eyes to prevent infection, and atropin and boric washes were continued, to avoid, if possible, an involvement of the iris and ciliary body. At the end of another week, however, the conjunctiva became gradually reinjected, the redness appearing as in the previous attack at the inner canthi, and for the first time nasal symptoms of a persistent character manifested themselves, the patient complaining that the nose felt dry and stopped, and a slight hemorrhage oc-

curred from the right naris. Reflecting that the first symptoms in the initial attack had been in the region of the canaliculi, and thinking that possibly there might be a causal connection between the nasal and ocular conditions, Dr. Packard was asked to make a rhinological examination. This was done, and a pronounced sphenoiditis was found, with gonococci in the secretion from the cells. Active treatment of the sinusitis was at once instituted, and as the nasal condition improved, the ocular symptoms, which had given evidence of attaining the same severity as in the first attack, rapidly subsided. While the lids were still swollen, however, and a thick glary muco-pus was being secreted from the conjunctiva, the cornea of the left eye became hazy, which upon high magnification, was found to be occasioned by the superficial layers of the cornea being studded with numerous small round grayish-white points of saturation. The cornea was avascular, and the picture was that of a superficial punctate keratitis. In a few days the right cornea became similarly affected. Photophobia was marked and vision was much reduced in both eyes. Ice, atropin and for a time dionin were employed, and several weeks elapsed before the ocular symptoms subsided.

During all this time the patient's general condition had been pitiable, nearly all of the large joints in the body being affected by rheumatism, and the bladder being still the seat of a purulent inflammation. He had, however, all that medical care and nursing could accomplish, and after twelve weeks he was able to leave his bed and walk with assistance.

During the summer months the patient visited a bathing resort abroad, in the hope of receiving relief from the stiffened joints which had resulted from the rheumatism, but while there a sharp attack of iritis developed, first in one eye and then in the other, which compelled him to relinquish all active rheumatic treatment. After a month of acute iritis, the eyes regained their normal appearance, and the patient was removed to Switzerland. At the end of but another few weeks, however, the left eye became reinfamed, and an intense iridocyclitis developed, which was attended with so much exudation and haze of the media that vision was reduced to counting fingers. He was then removed to Paris and came under the care of Dr. Mark Landolt, who finally succeeded,

after six weeks of energetic treatment, in dispelling the inflammation and restoring the vision to normal.

As soon as this was accomplished, the patient returned to this city, where he is now under my observation, the eyes at this time being entirely free from inflammation, though he is still under atropin to keep the irides and ciliary bodies at rest. His general condition has also greatly improved, the toxemia having apparently disappeared; several of his joints, however, are still stiff. Shortly after his return, the sphenoidal cells became freshly inflamed, but no gonococci were found in the secretion, and the condition yielded rapidly to Dr. Packard's treatment.

To briefly recapitulate: Urethral gonorrhea in a healthy young adult; general infection as indicated by articular rheumatism; involvement of sphenoidal cells with gonococci in the discharge; a week later, gonorrheal conjunctivitis of both eyes, apparently from continuity of tissue from the sinus cells. Disappearance of ocular and nasal symptoms under treatment, but after a short period reappearance of both conditions with the added element of a typical superficial punctate keratitis in both eyes. Cure after a month of active inflammation. Three months of absence of ocular signs, followed by a double iritis with a fresh outbreak of rheumatism while taking baths for rheumatism. Disappearance of symptoms for two weeks after a month of treatment, followed by intense irido-cyclitis in the left eye.

The next case which I have chosen to illustrate the subject of this paper has but recently passed from under my care and was an instance of quite a different type of inflammation, of the condition designated as *metastatic conjunctivitis*. The symptoms in this patient, who was also a young adult, began in a urethritis which was soon complicated by pain and swelling of the larger joints. Appropriate care was directed to both the local and general conditions, and the symptoms were markedly ameliorating, when both eyes became suddenly inflamed. When seen by me, but a few hours after the commencement of the inflammation, the lids of both eyes were swollen and reddened, and were bathed in a muco-purulent discharge. The cornea was at first clear, but after a few days became studded with irregularly rounded subepithelial semi-opaque areas, resembling, but not typical of, superficial punc-

tate keratitis. Photophobia was intense. A smear was made of the conjunctival discharge, but no gonococci were found. Bacilli coli communis, however, were seen in smears made directly, and developed on culture media, apparently in pure culture.

While the latter case was evidently one of the not uncommon type known as metastatic conjunctivitis, the precise origin and character of the inflammation in the first case is not so easy to determine. It would appear, however, that the inflammation of the conjunctival mucous membrane was secondary to that of the mucous membrane of the nose, as a consequence of continuity of tissue, through the medium of the lacrimal apparatus. The onset of two attacks of conjunctivitis in the region of the canaliculi, favors this supposition, while the comparatively mild character of the inflammation of the mucous membrane, and the appearance of the symptoms in both eyes simultaneously, discredits the assumption that it resulted from direct infection. It may be suggested that, as in the later attacks, the irido-cyclitis and iritis, and possibly the punctate keratitis, were induced by toxemia, and were endogenous, the primary attacks of conjunctivitis were of a similar origin, and should be regarded as metastatic. The presence of gonococci in the conjunctival secretion, however, rather militates against this, although as will be presently mentioned, gonococci have been found in some metastatic cases.

The case, with its protracted course, in any event, is one of very great interest, and if the involvement of the conjunctival mucous membrane did proceed from that of the nasal mucous membrane, it is, as far as I am aware, unique as an observation of a purulent rhinitis being communicated to the ocular mucous membrane. The peculiar escape of the lacrimal and nasal mucous membrane from involvement in cases of severe purulent conjunctivitis, is a matter of every-day experience. Indeed, the Schneiderian mucous membrane seems to possess a remarkable tolerance for gonococci, for gonorrhea of the nose is very rare; indeed Dr. Packard tells me that it is practically unknown. In this case, the patient had had the habit of picking his nose, and the micrococci were doubtless conveyed to the nares in that way.

Metastatic conjunctivitis has long been a recognized disease of the conjunctiva, but it can scarcely be said to be, even at

this time, a generally recognized condition, for ophthalmologists make but little of it, and rarely diagnose it. Iritis and cyclitis secondary to a specific urethritis are well known, and not uncommon ocular conditions, but attention is called but rarely to a conjunctivitis of similar origin. A century ago, before Jaeger in 1811 accidentally discovered the direct contagiousness of the gonorrheal secretion, practitioners thought all cases of gonorrheal ophthalmia were of metastatic origin. After Jaeger's experience, however, the metastatic theory for the origin of conjunctivitis died out, though it still held, for iritis and joint affections, so that in their time Arlt,¹ Mackenzie² and von Graefe³ all denied the possibility of a purulent conjunctivitis arising other than by direct infection. In 1866, Fournier,⁴ however, in a lengthy treatise upon blenorrhea showed conclusively that there were cases of conjunctivitis which occurred in association with a specific discharge from the urethra, which were dependent, not upon direct, but upon metastatic infection. This author stated that he had found this form of conjunctivitis fourteen times more frequent than that caused by direct infection, and these figures were supported by J. William White,⁵ writing twenty years later, who stated that he had found only one instance of gonorrheal ophthalmia among seven hundred to eight hundred gonorrheal cases, while he had observed one case with metastatic conjunctivitis among fifty to sixty cases.

The first ophthalmologist to call attention to the existence of a conjunctivitis which was not occasioned by direct infection with gonococci was Haab,⁶ who reported a case of conjunctivitis in both eyes in a gonorrheal subject, which was cured in six days. There were no gonococci in the secretion. Haltenhoff⁷ described five similar cases and gave the literature, and other instances have been recorded by Parinaud,⁸ Vanderstraeten,⁹ Gielen,¹⁰ Lichtenstein,¹¹ Van Moll,¹² Morax and Elmassian,¹³ and Fage,¹⁴ so that there can now be no question but that conjunctivitis may arise in gonorrheal cases from metastasis, quite similarly to iritis, scleritis and optic neuritis, and the explanation of this is not difficult when one reflects how often the ocular mucous membrane in common with other mucous membranes constitutes an avenue of escape for abnormal and toxic fluids. How often do we not find that rheumatic and gouty inflammations of the conjunctiva and epis-

cleral tissues, and the eczematous eruptions which occur there are attributable to an auto-intoxication of gastro-intestinal origin? The extensive lymphatic system in this region, and the circulation of fluids through it, doubtless frequently occasions the deposit of organisms there which are more or less laden with toxins, and even with microbes themselves.

Although the reports of cases of metastatic conjunctivitis where bacteriological examinations have been made are few, it would appear that although the gonococci are found in the conjunctival secretion in some cases, they are absent in most. At times other micrococci have been found, but with the exception of staphylococci, which were discovered in the secretion by Van Moll, and thought by him to indicate a general toxemia by that organism as a product of urethritis, they may all be regarded as accidental findings.

This absence of the gonococci in the conjunctival secretion has been accounted for either by the fact that the conjunctivitis is excited by bacteria other than gonococci which originate in the urethra and invade the eye by way of the blood channels, or by the view that the inflammation is not the result of infection with micro-organisms at all, but is excited by the action of toxins generated by the gonococci. Axenfeld,¹⁴ in the discussion of Van Moll's paper upon the subject before the IXth International Ophthalmic Congress in Utrecht, suggests, however, that even though the gonococci are not found in the conjunctival secretion, they are not far off, but lie imbedded in the conjunctival tissue, and excite the inflammation from that point. According to him, the variable bacteriological findings which are observed in these cases may be explained in this way, and Morax, who has examined quite a large number of cases bacteriologically, has adopted the same view. Both agree that where gonococci are found in the conjunctival secretion, that an exceptional intensity of the inflammation is indicated. They suggest that the classification of all cases of metastatic conjunctivitis should be divided into two forms, severe and mild, according as gonococci are present or absent.

Just as in metastatic iritis, this form of conjunctivitis may occur in combination with an attack of gonorrheal rheumatism, or independently of it; in most cases, however, joint involvement is present. According to Haltenhoff, the conjunc-

tival affection may manifest itself either at the time of disappearance of the local urethritis, or two weeks later, or in other cases at the lapse of several months.

The inflammation of the conjunctiva has been observed in conjunction with iritis by Rückert," and with optic neuritis by Panas," and Cottmann and Haltenhoff have reported corneal complications. It has a strong disposition to recur, and this is particularly apt to happen with an exacerbation of an old attack, or with a fresh outbreak of urethritis.

White has given an excellent description of the chief clinical features of the disease, in a comparative table which he prepared, to show the distinction between this form of conjunctivitis, or *gonorrheal ophthalmia*, as it was formerly designated, and true *gonorrheal conjunctivitis*, or conjunctivitis from direct infection.

Gonorrheal Conjunctivitis.

Produced by contagion only.
Occurs once in seven hundred or eight hundred cases of gonorrhea.
May be derived from a second person by pus inoculation.
Involves one eye primarily.
Remains limited to eye originally affected, unless the other eye is accidentally inoculated.
Symptoms affect the conjunctiva from the start.
Symptoms of greatest gravity and urgency.
No association with subsequent gonorrhea.
No relation to joint troubles or other rheumatic manifestations.
Tendency to rapid destruction of tissues involved.
Treatment very useful; should be prompt and energetic.

Gonorrheal Ophthalmia.

Produced probably by septicemic infection. Has no relation to direct contagion.
Occurs once in fifty or sixty cases.
Can occur only in a patient having urethritis.
Involves both eyes usually.
Frequently passes from one eye to the other.
Symptoms affect the fibrous tissues, the sclerotic coat and iris. Symptoms mild, subacute.
Frequently returns with each later attack of gonorrhea.
Most commonly found to coexist with some other form of gonorrheal rheumatism.
Tendency to final but slow cure.
Treatment not very effective; should be mild and expectant.

In addition to this description, it may be remarked that the inflammation frequently begins at the external canthi as a serous edema associated with copious muco-purulent secretion, and then becomes localized for the most part in the retro-tarsal folds, and that in acute cases the bulbar conjunctiva becomes quite chemotic, and the lids edematous and swollen.

The therapeutics of metastatic conjunctivitis consists in the application of local remedies to the conjunctiva, in the treatment of the urethral condition, and in the administration of drugs to control the toxemia.

Cleanliness with astringents which should be varied in character and strength to meet the varied degrees of inflammation should be included under the local treatment, and the salicylates will be found of great service in meeting the latter indication.

NOTE.—In the *Rivista Italiana di Ottalmologia*, August, 1905, GIANI reported a case of double dacryo-adenitis from gonorrhea. There was a history of a local urethritis of ten days' duration. Gonococci were found in abundance in the urethral secretion, but repeated examination of the conjunctiva, and even of the punctured lacrimal gland, gave a negative result.

The author was of the opinion that the toxins proceeding from the gonococcus, rather than from the organism itself, caused the inflammation, and the nervous phenomena from which the patient also suffered. Giani inclined to the theory of toxic manifestation rather than to metastasis, basing his decision upon the fact of this manifestation taking place during the acute affection, and of the negative results of culture experiments upon the blood, the secretion and the gland.

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PARINAUD'S CONJUNCTIVITIS; A REPORT OF TWO CASES.*

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Since Parinaud¹ in 1889 first called the attention of the profession to the peculiar form of conjunctivitis now generally known by the name of Parinaud's conjunctivitis, there have been only forty-six cases thus far reported in the literature of the world. Only one case has been reported from Philadelphia. In the report of this case by Dr. W. C. Posey,² mention is made of a second case observed in a two-year-old child.

The meagre knowledge of this strange malady, and its apparent rarity, make it advisable that every case should be reported, in order that the aggregate records might throw further light upon its nature, and especially upon its infectious origin.

CASE I. F. L., male, age twelve years, was seen first at the Dispensary of St. Christopher's Hospital for Children, December 1, 1905. The following history was obtained: The left eye has been inflamed, and has discharged freely for one week. At the outset of the attack there was tenderness and swelling in front of the left ear. The discharge caused an excoriation of the skin below the eye; the lids were adherent in the morning. Photophobia and lacrimation were complained of from the onset, but are gradually getting worse.

The family history was negative, as was the previous ocular history. There was no history of contagion. Upon further questioning the boy stated that, after school, he cleaned and took care of two horses and a stable belonging to his father.

The condition noted when first seen was as follows: The left eye showed marked superficial excoriation upon both lids, especially down and out on the lower lid. There was *marked stillicidium*, though the lacrimal sac seemed normal. Marked ptosis is due to thickening above the tarsus of the upper lid.

*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, Nov. 20, 1906.

The bulbar conjunctiva was injected, and the palpebral conjunctiva covering the lower lid was thick and velvety, but no granulomata were noted. The lower fornix was chemosed.

Upon eversion of the upper lid, the conjunctiva was found to be very much reddened and edematous, and to contain numerous small translucent follicles resembling those of trachoma. These were especially numerous in the greatly injected and edematous fornix. The largest granuloma was 3×4 mm. in extent; the base was slightly smaller, and at the base was a narrow grayish ulcer.

The cornea was clear, and the pupil reacted freely to light. The right eye was perfectly normal and remained so.

The preauricular gland, directly over the center of the parotid gland, was very tender, and had the size and consistency of a lima bean. The temperature was normal.

The ocular condition remained the same for ten days, when the lacrimation ceased. The granulomata were unchanged, while the large follicles caused a great resemblance to trachoma. The preauricular glands had become very large and tender, and had every appearance of impending suppuration. The inframaxillary and post cervical superficial glands were moderately enlarged.

When last seen (seven weeks after the onset of the disease) the glandular swelling had disappeared entirely without abscess. The follicles were only slightly larger than normal, and the granulomata had entirely disappeared. The patient said that his eye now felt perfectly normal.

A number of bacteriologic examinations were made of the discharge, but cultures and cover-glass stainings were negative.

CASE II. (Fig. 1.) This case was more involved. C. T., female, school girl, age ten years, presented herself at my office Oct. 19, 1906, with the history that the left eye had been inflamed for the past ten days, for which she had been given an eye-wash by her physician. There was a free discharge, the lids adhering in the morning. Three days after the beginning of the ocular inflammation, the mother noticed a slight fulness in front of the left ear. The child had been feverish and restless since then, especially in the morning.

Family History—Mother and father living and well. Has one sister and one brother. Ocular history negative.

Previous History—She had chicken-pox at eighteen months, whooping cough at three years; malarial fever between four and six years, in the summer; measles, eight months ago. Three weeks ago a rash broke out over the whole body, consisting of a papule about one-eighth inch in diameter, which later was covered with a scab, and became slightly itching. It



Fig. 1. Case of Parinaud's Conjunctivitis. Dr. Krauss.

was accompanied by fever and cough, and lasted one week. The eye trouble began one week later, and was preceded by intense headache and feverishness, but no chill.

There was no history of direct contagion, except that near the patient's home is a stable, which the patient frequently enters, and in which is kept a horse that suffers from a sore mouth and walks lame. I could not obtain a veterinarian's diagnosis. The conditions when first seen were as follows: There was marked edema of the left upper lid, causing very considerable ptosis, a *marked stillicidium*, thin mucopurulent discharge, and injection of the bulbar conjunctiva. The lower lid was velvety, the follicles prominent, but no granulomata were present. Upon everting the upper lid the conjunctiva was found to be deeply injected, and studded with minute follicles, the fornix was edematous, and rolled out thickly below

the tarsus, giving the appearance of a tremendous sessile growth of erectile tissue.

There were a few small greyish translucent lymph nodes in the tarsal folds, behind this curtain of the fornix.

The superficial preauricular glands were enlarged to the size of a lima bean (about 8x15 mm.) and were slightly tender to the touch. There was some enlargement also of the super-



Fig. 2. Case of Parinaud's Conjunctivitis. Dr. Krauss.

ficial postcervical glands. The temperature was 99.2° at 5 P. M. Two days later, a large granuloma appeared behind the first fold of the fornix at the site of one of the smaller lymph nodes. It resembled a soft warty growth, the base being 3 mm., its apex 4 mm. in diameter, and its height about 3 mm.; at its base there was a greenish yellow necrotic area which

could not be removed. The fornix, though succulent, did not bleed upon handling.

The edema and ptosis were marked, as was the swelling of the preauricular gland, which was perhaps twice its usual size and very tender. The temperature under the tongue was 99.5°.

October 24, 1906, the fornix was intensely edematous, the first fold extending 8 mm. below the tarsus, giving the appearance of a turgid tumor. Upon this fold were several small



Fig. 3. Parinaud's Conjunctivitis. Dr. Krauss.

pearly bodies. Behind this fold were several lesser folds of the fornix, on the anterior one of which was the above described growth or granuloma now 4x5 mm., the base and apex being slightly necrotic. Microscopic examination of the discharge showed no bacteria. The lower lid was edematous, the cuticular surface being cyanosed (black and blue appearance as in contusion.) The patient complained of severe pain at the site of the enlarged lymph gland.

The following day Dr. Posey saw the patient with me and confirmed the diagnosis of Parinaud's conjunctivitis.

On Oct. 27, 1906, there were several additional granulomata in the fornix, all of which were covered with a greyish slough impossible to remove. The edema was still marked. The glandular swelling had become intense, and involved the submaxillary, inframaxillary, and the postcervical regions and the whole area occupied by the parotid gland. This is well shown in the photographs taken this day. (Figs. 2 and 3.) The temperature at 11 A. M. was 100°.

The parents refused to leave the patient in the hospital. I saw the patient two days later, the mother stating that the fever had been high for the past two days, especially at night, when the child was delirious. The swelling of the lymphatic glands was greater than ever, grotesquely distorting the child's appearance. They were very tender to the touch, and very hard.

The ocular condition showed improvement, the granulomata being smaller, and apparently disappearing by a necrosis of their superficial portions.

The temperature at 10:30 A. M. was 101½°, and gradually rose until evening, when it was 103.5°; near midnight it dropped to 102°.

October 30th, the temperature ranged from 99.8° at 10:30 A. M. to 103° at 7:30 P. M.

October 31, 1906, the highest temperature was 101° at 7 P. M., the lowest 99.5° at 2 P. M.

November 1st it remained steadily about 99°, and for one week it varied from 98.6° to 100.2°, the highest temperature being invariably in the evening.

October 31st, it was particularly noted that the eye had a diminished sensibility, application of a 2% nitrate of silver solution causing no distress. The smaller granulomata had almost disappeared, being now of a very deep and red or beefy color, and but slightly elevated.

On November 2nd, the large granuloma was about one-fourth of its former size, and very red. The sloughs had all disappeared. The conjunctiva was much less chemosed, so that the tumor-like fornix resolved itself into a thin but broad and long fold of mucous membrane hanging over the cornea

like a curtain, and at first glance might be taken for a thin, sessile granuloma. The glands were still very large and tender, but not so acutely painful.

November 4th, the hypertrophied fold of the fornix was smaller, and gradually shrinking; the glands were smaller and less painful.

Exposure to a cold wind while returning home from my office caused a return of temperature with increased glandular involvement and pain, which lasted three days.

November 8th. The fold of the fornix is thin and flabby, but still extends 4 mm. below margin of lid, and is beefy red in color. The discharge is slight; the swelling of the preauricular gland extends from the malar bone above to the mastoid process below, and behind the ear. The other glands are smaller.

November 10th, the conjunctiva is injected, but the granulomata have all disappeared, leaving no scarring or ulceration. The preauricular gland is soft in the center, and hard in the periphery, but is less tender.

November 18, 1906. The center of the preauricular gland is soft and fluctuating, with overlying skin reddened. The ptosis is much less, and conjunctiva thickened in the fornix but nearly smooth.

The typical symptoms and course of these two cases place them undoubtedly in the category of that rare and mysterious disease, Parinaud's conjunctivitis.

Parinaud's conjunctivitis, or infectious conjunctivitis transmitted by animals, as it is called by Parinaud, may be defined as an acute, non-contagious inflammation of the conjunctiva, characterized by the formation of granulomata, especially in the fornices, affecting usually one eye only, disappearing without permanent injury to the conjunctiva, and accompanied by simultaneous acute inflammation of the preauricular, and other superficial lymph glands of the same side as the affected eye. The infectious agent is at present unknown.

The symptoms in the beginning are those of a mild case of unilateral catarrhal conjunctivitis. There is a marked mucopurulent discharge, which soon becomes watery. There is a sensitiveness to light, and the lids are adherent after sleep. Pain in the eye is rarely a source of complaint at any time.

The vision is unaffected. Objectively there are present early in the disease a marked ptosis due to the swelling in the retro-tarsal folds, and *much stillicidium without involvement of the lacrimal sac*. The bulbar conjunctiva is slightly injected, the cornea remains clear, and the iris normal throughout the course of the disease.

In the palpebral conjunctiva, the characteristic large follicles, or granulomata of various sizes and groupings are found, most numerous and of greatest size in the region of the fornix and retrotarsal folds. These follicles are at first small and translucent; in some cases they may be large, assuming great proportions, and of a yellowish red color, or greyish, especially at their bases.

After sloughing, the granulomata get smaller, beefy, red in color, and finally entirely disappear without leaving a trace of their former presence. They may attack either the upper or the lower cul-de-sac.

In spite of their formidable appearance, and their sluggish disappearance, the cornea and iris remain unaffected.

Simultaneous with the appearance of the ptosis, the parauricular gland becomes slightly enlarged, but soon assumes enormous proportions. Involvement of the glands behind and below the ear, the post cervical, and later, the inframaxillary glands follows. The preauricular glands are painful and tender to the touch, the other glands much less so.

As long as the acute inflammation in the gland continues, the temperature of the patient is elevated accordingly. There is danger of abscess formation after the acute symptoms subside.

Although the eye condition may steadily improve, the glandular inflammation and enlargement may steadily extend, showing that, not only are the toxins carried into the lymphatics, but also perhaps the toxic agent. The latter apparently reaches most frequently the preauricular gland, since this is usually the gland that becomes most tender and suppurates.

The disease runs a chronic course and ends finally in perfect recovery without scar formation in the conjunctiva. Only one eye is affected in nearly every instance (37 out of 39 cases).

Etiology is still unknown. Parinaud supposed that the cause was to be found in some infectious material transmitted from animals, especially horned animals.

Nothing has as yet been found to directly corroborate this statement. Hoor,⁸ in his analysis of 33 cases of undoubted Parinaud's conjunctivitis, found in 65% of the cases, a possibility of animal infection, and in 35% was unable to establish a relationship.

More or less intimate contact with horses was noted in both of my cases, in one of which the horse was stated to be diseased.

Granting that it is of animal origin, it is rather unusual for such an infection to confine itself to so few individuals, and the patient not be in turn infectious to his neighbors.

An explanation along this line that seems to be tenable, is, that the infectious matter requires a specially sensitive individual, and that the majority of people are immune. As these animals are frequently seen in the streets, it would seem that otherwise everybody is more or less exposed to infection, as the animal discharges become dried, and are wafted about by the wind in the form of dust.

The pathologic histologic examination in two cases (Darrier's and Hoor's) gave a suspicion of tuberculosis, but the clinical and other examinations seem to disprove such a cause. Inoculations into guinea pigs have always been negative.

The histologic examinations made by Verhoeff and Derby⁷ show that the polypoid growths are made up of nearly organized tissue, richly infiltrated with cells, replacing the subconjunctival tissues. They contain no pus cells. In the superficial portions of the growth, the cellular infiltration consists almost exclusively of lymphocytes and epithelioid cells, and here and there a plasma cell. The epithelioid cells are highly phagocytic and often vacuolated, and resemble those found in the intestinal lesions of typhoid fever, and no doubt are of endothelial origin. There is extensive cell necrosis. Deeper down, the tissue is nearly normal, the cellular infiltration consisting almost entirely of plasma cells.

Matys⁴ found many plasma cells in the infiltration of the subepithelial tissues. Surrounding the blood vessels, he found in places a follicular growth, a few polynuclear white blood cells and very few mononuclear cells.

Reis¹ also finds the plasma cells very numerous in Parinaud's conjunctivitis, and believes that these cells are of vascular origin, in contradistinction to plasma cells from connective tissue cells. The latter are mainly found in trachoma granules, and in the healing process go to make up connective tissue, while the vascular plasma cells are absorbed by the blood vessels, disappearing without leaving any evidences of inflammation.

It would seem therefore that the more superficial portions of the polypoid growths disappear by cell necrosis, while the deeper tissues, containing many plasma cells of vascular origin, return to the normal by absorption without formation of new connective tissue.

Hoor believes that inasmuch as the presence of little nodules that resemble microscopically the structure of a tubercle are the most frequent pathologic change that has been noted, it is still possible that this disease is an exceedingly benign form of local tuberculosis.

The excellent analysis recently published by Hoor, renders detailed study of the literature unnecessary. It may not be amiss, however, to add the cases of Reis and Spratt,² and the two cases here reported, to the forty-four cases collected by Hoor, making in all forty-eight cases. Of these forty-eight cases, the age is given in forty instances.

42.5 *per cent* occurred between the 10th and 17th year.

15 *per cent* occurred between the 2nd and 9th year.

12.5 *per cent* occurred between the 20th and 25th year.

10 *per cent* occurred between the 25th and 39th year.

10 *per cent* occurred between the 40th and 50th year.

7.5 *per cent* occurred between the 50th and 60th year.

2.5 *per cent* occurred above the 60th year.

Therefore it will be seen that 70% of the cases occurred in patients under twenty-six years of age.

The right eye is much more frequently affected than the left. It is supposed that this is due to the fact that most people are right handed, the corresponding eye being therefore most easily infected.

Nearly all of the cases have occurred in temperate climates, the Fall and early Winter producing the overwhelming majority of cases. The duration of the illness varies from 2½ weeks to many months.

Diagnosis and Prognosis.

Parinaud's conjunctivitis is one of the most readily diagnosed conditions, from the fact that we have unilateral conjunctivitis with intense swelling of the retrotarsal folds, studded with more or less numerous granulomata of varying size and color, causing a marked ptosis, and accompanied by a comparatively small amount of secretion; associated with these symptoms is a marked enlargement of the more superficial lymph glands of the face and neck, especially prominent first and last, being the preauricular gland.

It might be confused with trachoma, follicular conjunctivitis, tuberculosis or syphilis, and lymphoid hypertrophy, but each of these has accompanying features which would render the differentiation rather easy by watching the course of the disease.

The prognosis is uniformly good, especially if recognized and treated. Many cases have recovered with practically no treatment, but the convalescence in these cases was tedious.

The *treatment* recommended varies from mild antiseptic washes only, to destruction of the nodules with galvano-cautery or caustics, or by excision, and suture of the conjunctiva.

The treatment adopted in the two cases above recorded was as follows: Mild washes of bichloride of sodium, and camphor water were given every three hours.

Argyrol in a 25% solution was instilled every four hours, and was continued in spite of the fact that the patients stated that it caused a burning sensation.

Nitrate of silver in a 2% solution was applied to the everted lids, and caused no unpleasant sensation, until the lids were nearly smooth.

Ice compresses were applied to lids at frequent intervals.

For the glandular swelling, hot compresses of lead and opium were constantly applied, covered with thick layers of raw cotton and oiled silk.

When there is evidence of the glands having broken down, an incision should be made to evacuate the pus and favor healing.

The temperature was controlled and the pain lessened by the use of phenacetin and tannate of quinine ointment. Tonics of iron and iodine were given later.

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THE OCULAR SYMPTOMS IN A CASE OF TUMOR OF THE PITUITARY BODY.*

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The following brief description of the anatomy of the pituitary body is taken from the second edition of Holden's Anatomy, edited by Hewson:

"The pituitary body or hypophysis occupies the sella turcica, and is of a reddish-brown color and consists of two lobes. Of its two lobes, the anterior and larger is concave posteriorly to receive the posterior lobe, and weighs from 5 to 10 grains. The two lobes consist of different structure and differ in their development. The posterior is developed downwards from the third ventricle and is hollow; subsequently there is a large increase of connective tissue structure and blood vessels in it so that the cavity is usually obliterated. The anterior is darker, and is surrounded by a connective tissue capsule; on section it resembles in structure the thyroid gland, being composed of reticular tissue, with numerous cavities filled with nuclear cells and granular matter; it is originally developed as a prolongation from the ectoderm of the buccal cavity, from which it soon becomes isolated."

The optic tracts, originating posteriorly in the corpora quadrigemina, corpora geniculata and the optic thalami, wind around the crura and meet anteriorly in the middle line to form the commissure which rests upon the sphenoid bone in front of the sella turcica. Therefore, it will be seen that enlargements of the pituitary body or growths springing from it and encroaching upon adjoining tissues, should involve first of all the anterior termination of the tracts, just as they are about to form the commissure, one or both, according to size and direction of growth. The third, the fourth, the ophthalmic division of the fifth and the sixth nerves pass into the orbit through the sphenoidal fissure, and by reason of their course at the base of the brain, are not compressed or directly implicated. The function of the pituitary body is unknown.

*Read before the American Ophthalmological Society, New York, June, 1906.

That it is in some way connected with the function of the glands of the body, particularly the thyroid is the common belief, because in abnormal states of the pituitary body, other than tumors, the symptoms point less to central lesions than to those of general nutrition, or to disease of the general nervous system.

The ocular symptoms are probably not due to extension of the disease of the pituitary body to the eye structures themselves, but the latter are involved because of the anatomical relation of the body to the chiasm, and this is true whether the enlargement of the pituitary body be due to disease of its own tissues primarily, or the seat of a new growth by which the anatomical features of the body are deranged or destroyed. Hypertrophy or tumor, too limited in its lateral extensions to compress the tracts, would probably give rise to no ocular symptoms whatever unless the vertical growth should be exceptionally great and displace the structures comprising the floor of the third ventricle. A growth of this size and form originating in the pituitary body is rare.

The ophthalmoscopic findings relate exclusively to the conditions of the optic nerve head and the retina immediately adjacent to it. The remainder of the retina and the entire uveal tract seem to be free from involvement. The most common finding is optic nerve atrophy. Early in the course of the disease, the nerve head may in no way differ from the normal, or there may be papillitis to the degree of choking of the disk. This great variation may be attributed to the time when the patient first comes under observation; to the size attained by the tumor, and the amount of pressure exerted upon the optic tracts, and to the degree of interference with the circulation in the optic chiasm and nerves. Choking of the disk is not common. In thirty-eight cases collected from the literature by Rath (*Archiv. für Ophth.* Bd. 34, 1888) five only are reported to have had choking of the disk. Heusser (*Path. Inst. zur Heidelberg*), who studied twenty cases, noticed the same comparative infrequency, and ascribed the rareness of choked disk to two causes: first, while the tumor is moderate in size, it is positively separated from the rest of the brain by reason of the strongly-stretched dura, and it is not able to raise the intra-cranial pressure to the necessary degree; second, by its position, it may so compress the optic

nerve sheathes, that the cerebrospinal fluids may not enter. That optic nerve atrophy is common is shown by its presence in most of the published cases. In Rath's thirty-eight cases, five had no symptoms, and the tumor was found accidentally at the post-mortem examination; thirty were studied ophthalmoscopically. Of these, five had choked disks (which no doubt would have been atrophied nerves, had the patients survived) and twenty-five had atrophy either partial or complete. It is not improbable that some of the cases of so-called idiopathic atrophy so often unexplainable, are cases of tumors of the pituitary body, for such tumors may exist for a long time without other symptoms than deterioration of vision through optic nerve atrophy. They may have spinal diseases, particularly posterior sclerosis as a cause, for it is well known that degeneration of the optic nerves may precede for years the appearance of the characteristic symptoms of tabes. It is well to remember, however, in guessing at the causation lesion, to consider the possibility of tumor of the pituitary body. The latter diagnosis would be naturally strengthened by signs of acromegaly or evidence of disease of the thyroid or other ductless glands.

The symptoms are modified according to the size attained by the tumor, according to the rapidity of its growth, and possibly according to its nature. The most important symptom, and the one to which attention is usually first drawn, is the reduction of vision. This is of various kinds and includes the loss of central acuity, or alteration in the size and form of the field. Bitemporal hemianopsia is common at some stage of the disease, although this defect is not always well marked nor permanent. Disproportionate lateral growth of the tumor might lead to complete blindness in one eye, and hemianopic fields in the other. Eventually the hemianopic character of the field is lost by the advance of the optic nerve atrophy, and gradual encroachment of the blind field upon the seeing field. During this process scotomas of irregular form and shape, and subject to change, may be found by careful perimetric measurements. The central fixation point is often excepted for a long time from the hemianopsia, or other forms of loss of field. This "over-shot field of vision," as it has been called (to quote from de Schweinitz and Carpenter—J. A. M. A., Jan. 14, '05), suggests the supply of the macula with a double

set of nerves, one from each hemisphere, and has been explained by Schmidt-Rimpler by assuming anastomosis of the fibers in the optic nerves and chiasm. The field defects in chiasm lesions are explained by Wilbrand and Saenger (Bd. III., Abth. 1.) to which classical work the reader is referred for an exhaustive study of the subject. Rath studied the reports of cases of tumor up to 1888, and gives the symptoms most frequently manifested. Pain in forehead and temples radiating into the orbits, and early amblyopia with temporal hemianopsia. In the beginning, negative ophthalmoscopic findings, later, simple (not preceded by papillitis) optic nerve atrophy. Sometimes paralytic strabismus, drowsiness, weakness in the legs, a peculiar form of dementia, and simultaneous diabetes mellitus or insipidis, vomiting, dizziness and epileptiform convulsions are noted. Müller (Arch. f. Ophth. Bd. 8-1861) described a case in which the principal symptom was alternating blindness and bitemporal hemianopsia. Takaloff (Virchow's Arch. Bd. 43, 1898) reported a case of gumma, "large as a walnut and cheesy," in a woman of 44 in which the only cerebral symptom was dilatation of the right pupil.

CASE:—S. L., male, aged 53, sent to me for examination of his eyes by Dr. J. K. Crawford of Philadelphia, Nov. 11, 1901. The patient complained of a veil over the left eye that had existed for some time, and of the inability to see clearly to read. He had no pain, no photopsia. Pupils equal in size and react. He has been for the past three months drowsy, and during sleep was given to talking and dreaming. The lens O. S. was opaque in cortex, nerve pale, vessels small, no preceding neuritis. White field concentrically and decidedly limited; small negative central scotoma. No color perception. V. = 20/200. In O. D. the nerve was pale, and the field concentrically contracted for form and colors, but both changes were less marked than in O. S. V. = 20/40pt. Momentary diplopia in extreme right field, probably commencing paralysis of external rectus of O. D. was noted, June 12, '02: Pain in eyeballs. Vision reduced to O. D., 20/100, O. S., 10/200—, central scotoma in O. S. unchanged. Fields increasingly limited, nerves white, and becoming cupped. March 2, '03:—Fields are now smaller, and are irregularly bitemporally hemianopic. Dr. Crawford stated that during the early part of his sickness somnolence was the principal symptom. For twenty-two days

he averaged twenty-two hours sleep each day. In the last eighteen months of his life, he became totally blind on four distinct occasions, the blindness lasting in each instance about six weeks. From every attack except the last, he slowly recovered perception of light. During the past two years he was subject to terrible attacks of temper, and became while raging, almost cyanotic. He never complained of headache or vomiting. Station good, slight atheroma; no glycosuria at any time. Dr. Crawford believed that the bones of the nose and orbit were slightly enlarged. The post-mortem examination was confined to the contents of the cranium. A dark brown tumor was found occupying the site of the pituitary body, and measuring 4 cm. horizontally by 1 cm. antero-posteriorly. No sign of inflammation of the adjoining tissues could be found. The optic chiasm and tracts were compressed and atrophic. The nature of the tumor is not definitely known, for the report of the microscopic examination has been lost. Adenoma, sarcoma, cysts, carcinoma, tubercle and gumma have been found post-mortem, and their growth is said to be generally toward the orbit rather than toward the brain. The prognosis both for sight and for life is most unfavorable.

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CONJUGATE PALSY OF THE UPWARD AND DOWN-
WARD MOVEMENTS OF THE EYES:
A REPORT OF TWO CASES.

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CASE I.—A. B., male, nine years of age, was brought by his mother to the Eye Department of the Jefferson Medical College Hospital in September, 1906, for examination and treatment. Four years previously, in the same institution, he had submitted to the operation of double tonsilectomy, and later had been seen by the attending ophthalmologist. His early age, however, precluded a satisfactory examination, and his mother was advised to return with him within three or four years.

In tracing the family history, the following features, interesting and significant because of the mental condition of the patient, were revealed. His father and mother had apparently enjoyed good health, and no history of insanity, tuberculosis or specific disease in previous generations was shown. Of the eight children, three, ages one week, two years and three years, respectively, had died of unknown diseases. The oldest brother and the oldest sister were married and in good health. The second brother, nineteen years of age, crippled and feeble-minded, was an inmate of the Training School at Vineland, N. J. The remaining sister, to whose record I will refer later, also presented signs of weakened mentality. The patient was slight, weighing less than his age would indicate, and yet seemed to be in moderately good health. He received a meagre common-school training, rendered of little value, however, because of parental laxity in enforcing regular attendance and his feeble intellect. Mild headaches and inability to use the eyes in continuous near work were the principal ocular symptoms. V. = 20/30 in each eye. Pupils were equal and about 3 mm. in diameter. Irides reacted well to direct and indirect stimulation, but sluggishly to accommodation and convergence. Media clear, and fundi normal. No attempt was made to correct the low grade hyperopia indicated by the ophthalmoscope. Examination of the associated action of the

muscles of rotation showed the following features. The lateral excursions of both eyes were perfectly performed, both singly and in association. Vertical rotations, both upward and downward, were entirely in abeyance. Convergence, frequently lacking in conjugate palsies of the eyes, was unimpaired. Accurate measurement of the fields of vision was impossible on account of the lack of intelligence on the part of the patient, but as roughly estimated no limitation was shown. No diplopia.

CASE II.—Female, age sixteen, sister of Case I, was examined at the same time as her brother and found suffering from similar symptoms. She was short and well developed, but had never been strong or robust. Mentally she was deficient, as shown by her lack of progress in school, and her childlike replies during the examination. Her menstrual periods began at the age of fourteen and had been normal. She was brought to the hospital on account of symptoms of eyestrain. V. = 20/30 in each eye. Pupils were equal, about 3 mm. in diameter, and responsive to direct and indirect stimulation. Media clear and fundi normal. All attempts at convergence were futile. Total paralysis of the associated movements in the vertical directions was shown to exist. The lateral excursions were unaffected.

Dr. William G. Spiller examined the children at the Polyclinic Hospital and reported as follows: "Both seem to be imperfectly developed mentally, especially the boy, but otherwise have no symptoms of nervous disorder. The speech is not peculiar, there is no ataxia, no impairment of patellar reflexes. In the girl the reflexes are present, but not prompt, and yet hardly abnormal. I regard the cases as examples of arrested development of the ocular muscles or nerves concerned in upward or downward movement."

Conjugate paralysis of the vertical movements of the eyeballs is comparatively infrequent. Cases have been reported by Wernicke, Graefe, Uhthoff and a few others. Few autopsies have been made and consequently the pathology is uncertain. The subject is of great interest to oculists and neurologists. In the *ANNALS OF OPHTHALMOLOGY*, 1904, is found an excellent paper by Posey on this subject, in which he reports two cases. The first was that of a man of forty-eight years with inability to raise the eyes singly or in association above the

horizontal plane. The lateral excursions were normal, but slightly sluggish; the downward movements, however, were made only with great difficulty.

The power of convergence, like in the second case cited above, was lost, although each internus functionated normally in associated movements to right and left. The second case, an elderly woman, with a history of apoplexy six months prior to examination, showed complete palsy of the upward movements, but responded normally to the tests of ocular movements in all other directions. Posey concluded the seat of lesion in these two cases to be in the neighborhood of the corpora quadrigemina. Posey refers in extenso to a paper of Kornelow of Moscow (*Deutsche Zeitschrift für Nervenheilkunde*, Vol. 23, s. 417), in which two cases of associated paralyzes are reported. One of these suffered from polioencephalitis superior of Wernicke, and the other from a tubercular deposit. The former showed total conjugate paralysis for upward and downward movements, and the latter, paralysis for upward movements only, with a moderate limitation of left lateral duction. Additional motor disturbances were shown to be slight paresis of the inferior branch of the facial, and of the hypoglossus in the first case, and a paresis of the facial and of the right arm and leg in the second. Speech disturbances were observed in both cases with some symptoms cerebral in character. Knee-jerks absent in the first, but exaggerated in the second case. The mentality of both patients was unimpaired. Kornelow, in examining the literature, was able to find but twenty cases. In three of these no symptoms referable to the nervous system were shown. Seven showed complete absence of convergence, and slight impairment of this function was noted in three. Eight out of the twenty cases exhibited conjugate palsy for both the upward and downward movements of the eyes. Failure of pupillary reaction was seen in nine, and loss of the accommodation in four. Inequality of pupils was noted in seven, and diplopia in five. The optic disk became affected in seven, including pallor of the disk, hemianopsia, and limitation of the visual fields. In three, the auditory nerve was affected, and in five there was involvement of the abducens. Six cases presented paresis of the inferior branch of the facial, and two of the hypoglossus. Paralysis of the levators was seen in two, and nystagmus in four.

Hemiplegia or hemiparesis of the extremities in eight. In six, disturbances of speech were observed, and in eight the gait was affected. Four exhibited lowered mentality.

We may assume that syphilis and diabetes were the etiological factors in some of these cases, while in others the cause cannot be found. The onset was frequently sudden, after an attack of apoplexy, or followed an acute affection, characterized by violent headache, vomiting, stupor, and rise of temperature. In others the condition was slow in development. The affection was usually progressive in character, very few cases recovering. Of the ten or eleven cases upon which post-mortems were made, involving the parts near the corpora quadrigemina, neoplasms were found in eight.

We may assume from the studies of Andral, 1834, who was the pioneer in investigating the subject of conjugate deviation, and of Duplay, Durand, Fardel and others, that the cerebral cortex plays an important role in the control of the associated movements of the eyeballs. All evidence at least points to the probability of the lateral conjugate movements being so governed. In respect, however, to the up-and-down ocular movements, localization, or even the existence of a cortical center or centers is a point of controversy. Attention has usually been given to the lateral associated palsies, rather than to the vertical, because of the less frequent presentation of the latter, and the great difficulty experienced in obtaining autopsies. Evidence of a character to positively indicate the existence of a center or centers for the up-and-down movements of the eyes has not yet been obtained anatomically or pathologically, but by carefully reviewing the cases of this form of palsy such a center or centers can reasonably be assumed to exist.

Some investigators are inclined to believe that a center or centers for conjugate movements exist in the corpora quadrigemina themselves, and that a lesion in this portion of the cerebrum will cause associated ocular palsies, but it is questionable if a lesion confined to this region, and producing no pressure symptoms on the surrounding tissues, will induce any such result. Thus far, at least, those advocating this theory have failed to produce convincing proof of the presence of a supra-nuclear center in this locality.

Bernheimer, as cited by Spiller, in a number of experiments, showed how electrical stimulation of the corpora quadrigem-

ina in rabbits produces no ocular movements, and that the removal of the corpora quadrigemina gives negative results. These findings were additionally confirmed in his experiments upon the brains of monkeys, in which, by the destruction of the corpora quadrigemina the ocular movements were in no way impaired. Furthermore, by the irritation of the angular gyrus, following the complete removal of the corpora quadrigemina, ocular movements were obtained. Spiller refers to the cases of Wunland, Seidel, Ruel, and Nissen, in which the corpora quadrigemina were destroyed with no effect on the ocular movements. We might infer, therefore, from these experiments, that a center or centers for the associated ocular movements do not exist in the corpora quadrigemina themselves. Kornelow is inclined to the belief of the existence of a center of co-ordination for associated movements above the nuclei, and favors the assumption of such a center on each side of the brain, each being controlled by both hemispheres, in consequence of which, associated palsies could be effected by the disturbance of the centers or pathways on both sides of the brain only. To strengthen his argument, he cites the palsies, always of the associated type, to be seen in connection with hysteria, and as further confirmatory evidence, refers to the continuance of reflex, and the absence of voluntary movements, observed in association with them. He concludes his discussion by averring that peripheral disease may be provocative of associated palsies, and begs that great care be taken in the examination of these cases, in that symmetrical clinical manifestations are indicative of disease within, and the asymmetrical disease below, the supranuclear region. Spiller, on the other hand, contends that the assumption of the existence of a co-ordinating supranuclear center in or near corpora quadrigemina for the upward and downward movements is unnecessary. Assuming, as he does, that the nuclei for the superior rectus and the inferior oblique lie in the posterior part of the oculomotor nucleus, a tumor developing ventrally in the pons may, by pressure upon this area, produce associated palsy of upward movements, and believing further, as we must, that there is a close connection between the nucleus for the superior oblique and the nucleus for the inferior rectus muscles of the same side, and possibly of the opposite, any lesion affecting both of these nuclei will produce associated

paralysis of downward movements. He supports these views with two of his own cases in each of which palsy of the upward movements of both eyes was caused by a lesion posterior to the oculomotor nucleus, with no involvement of the corpora quadrigemina. To some, the theory of a basal co-ordinating center above the oculomotor nucleus seems possible. But, recalling the function of the posterior longitudinal bundle in connecting the nucleus of the branch to the rectus internus muscle, and the nucleus of the abducens, and thereby explaining associated lateral movements, it seems fair to presuppose the existence of certain fibers connecting the different parts of the oculomotor nucleus one with another. An affection of these fibers, possessing as they probably do a co-ordinating function similar to that of the posterior longitudinal bundle, would induce a paralysis of downward associated movements.

The seat of the lesion in persistent palsy of the vertical associated rotations, according to Spiller, is usually found near the oculomotor nucleus. He considers that disturbances of the extracerebral fibers are never productive of conjugate palsy.

In respect to the etiology of this condition tumor seems to be the most common cause in adults. It has been observed in syphilis and in inflammatory lesions. Disappearance of symptoms may be expected if due to last named cause. A few cases due to polioencephalitis superior of Wernicke need mention. Congenital and hereditary defects play a part in the production of associated palsies, but cases so complicated cannot be viewed as true paralyzes, as they represent arrested development of the muscles or the nerves controlling them.

Treatment is unavailing in most cases, as the tumor, if this be the cause, is located in the posterior part of the pons. A palliative operation only may be considered under these circumstances. In cases of inflammatory or syphilitic nature, favorable results are obtained by the use of mercury and the iodides. Recovery of the normal mental activities is very rare in congenital or hereditary cases.

1528 Walnut St.

A MODIFIED PAQUELIN CAUTERY FOR OPHTHALMIC USE.

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A miniature Paquelin cautery was described by W. H. Beach in the *Lancet*, December 17, 1904, and about a year later Sydney Stephenson suggested its use for ophthalmic purposes in the *Ophthalmoscope*, 1905, p. 610. The apparatus was similar to that used in pyrographic work, but differed in that there was no bottle for the benzine, the handle being hollow and serving as a reservoir for this purpose. Air was supplied by the usual rubber bulbs attached near the lower end of the handle, a position that seemed undesirable, and there were a number of parts, including a delicate valve, which made the apparatus rather complicated and liable to get out of order.

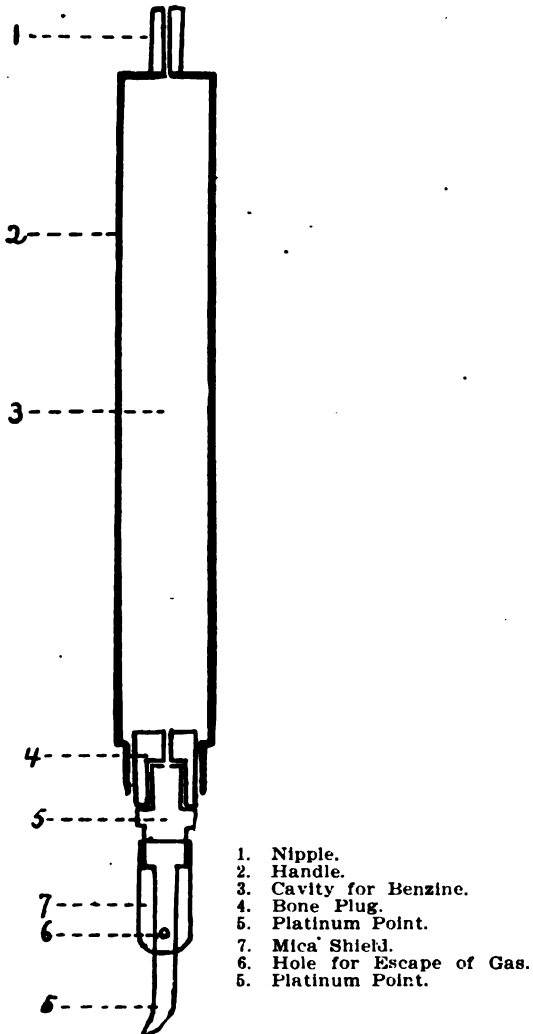
As such an apparatus seems very suitable for use by oculists, dermatologists, etc., and as it is exceedingly portable, if simplified and made for a reasonable cost, it would seem to supply a long-felt want. It cannot and is not intended to supplant the electro-cautery.

Construction.—The instrument as modified consists of a brass tube or handle, 4 inches long and $\frac{1}{2}$ inch in diameter. One end is furnished with a nipple to which a rubber tube, connected with the rubber bulbs, is attached. This arrangement allows the rubber tube to pass over the back of the hand when in use, so that the tube cannot obstruct a proper view of the point, nor can it easily be burned. At the lower end of the brass tube is fitted a bone plug (a non-conductor of heat), perforated with a small hole to allow the benzine vapor to pass to the platinum tip. This hole is so small that there is no danger of a flare-back. To this bone plug is attached a platinum point such as is furnished with a pyrographic outfit. This point is of good shape, as one side is pointed and the other rounded. The cavity of the handle is loosely

Presented at the Ophthalmological Section, New York Academy of Medicine, December 17th, 1906.

filled with wicking or coarse asbestos fiber. Without the rubber bulbs the instrument weighs slightly less than one ounce.

Method of Using.—The platinum point is removed, and about ten drops of benzine are dropped into the handle, after which the point is replaced and the rubber bulbs attached. It is important that the benzine should be entirely absorbed by



A Small Paquelin Cautery for Ophthalmic Use. (Coburn.)

the packing in the handle. If so much benzine is introduced as to more than saturate the packing, the superfluous amount should be allowed to drain out before using. The tip is now heated in an alcohol flame, and when red hot the bulbs are compressed, and air is forced through the handle, carrying with it the benzine vapor into the tip, causing it to glow. With ten drops of benzine the instrument may be used from ten to fifteen minutes. As the hot gases which come from a small opening in the platinum point may possibly burn the patient if held too close and directed toward the patient, a small mica shield is supplied. As this is readily detachable, it may be used or not, as desired. The instrument should be held in the hand like a pen, and in this position the application of the point can be carefully watched.

Safety, Cost and Field of Usefulness.—This cautery is as safe as any Paquelin cautery where chloroform or ether is used, and is far safer than an alcohol flame used to heat a platinum probe. It should be manufactured for less than half the cost of Stephenson's, which is \$15.00. For ophthalmic purposes, this instrument is useful to cauterize corneal ulcers, conical cornea, and to destroy new growths of the eyelids or eyeball. Owing to its safety, simplicity, small cost, ease of manipulation and application, this cautery should prove a useful addition to the physician's armamentarium.

16 East 43d St.

• ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

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On Refraction at a Toric Surface.

LAMB, H. C. (*Archives of Ophthalmology*, Sept., 1906).

—In their treatment of lenses used in ophthalmological practice, most writers confine their attention to direct pencils of light, i. e., to rays passing through the central portion of the lens in the immediate neighborhood of its optical axis, but the eye, rotating in its orbit and viewing different parts of the field of vision, employs successively other portions of the lens as well, and it is exactly on account of the action of toric surfaces on the so-called oblique pencils emanating from the margin of the field of view that toric lenses owe their introduction.

In the above paper, the general problem of tracing analytically the path of any ray when refracted at a toric surface is outlined. Considering the toric surface as being generated by a circle revolving about an axis in its own plane, a system of rectangular co-ordinates is introduced with reference to which the equation of the surface is found in simple terms. The curvature of the surface in different planes or "meridians" is then examined and, by applying certain theorems of the theory of surfaces it is shown that

the normal or "perpendicular" to the surface at any point is determined by the radius of the generating circle drawn to that point. The precise nature of the surface at such a point is then found by passing planes through this normal in different directions successively; and "the aggregate of all these so-called 'normal sections' at any point gives a true picture to the surface in the neighborhood of that point." A toric surface is shown to have two principal curvatures, viz., one maximum and one minimum radius of curvature between which two extreme values all other curvatures lie. The minimum radius of curvature is found to be invariable for all points of the surface and equal to the radius of the generating circle; the maximum radius of curvature in any point of the surface is given by the distance, measured along the normal, from the point considered to the axis of rotation of the generating circle. Finally the curvature of any intermediate normal section is shown to depend in a simple manner upon the two principal curvatures just considered.

The curvatures of the toric surface in any "meridian" thus being known, the problem of toric refraction resolves itself into the consideration of the refractive action of small surface elements of known conformity, inasmuch as any one of the normal sections above referred to is evidently nothing but the plane of incidence, or refraction, which a ray striking a toric surface traverses. "In this plane, in the immediate vicinity of the point of incidence, the surface acts like a spherical surface having a radius equal to the radius of curvature of the toric surface in this plane," and the general problem of toric refraction mentioned at the outset is reduced to the well known case of spherical refraction.

For the mathematical formulae and explanatory diagrams reference must be had to the original.

Quinine Amaurosis With Report of a Case.

PARKER, Frank Judson, M. D. (*Archives of Ophthalmology*, September, 1906).—The case which the author reports seems of special interest because the patient had no idiosyncrasy for the drug, the exact dose was known, and an exceptional opportunity was afforded for following the case and studying the ocular changes from perception of light to normal telescopic vision. The patient's condition when first seen was as follows: Stupor, irregular and rapid

respiration, and occasional periods of collapse. He had taken by mistake a total of two hundred and forty grains in twelve hours, and awoke the next morning with terrific noises in his ears, loss of sight, and delirium alternating with collapse. An examination four days later showed, pupils widely dilated, no reaction to light, cornea slightly hazy and marked hyperesthesia, tension minus two, and perception of light, so far as it was possible to test him, the hearing was normal, he had not complained of head noises or deafness since the first twenty-four hours after taking. Fundus examination showed extreme pallor, nerve pearly white, thrombus of the inferior branch of the retinal vein, the blood column broken in places; endarteritis of the large branches and obliteration of the small arteries, veins dilated, the iris was very dull in appearance and showed no reaction to light. The left fundus showed the same condition except the thrombus was of the superior branch of the retinal vein. The treatment was as follows: Nitroglycerin, 1-75 gr. every four hours; amyl nitrite 2 m. three times a day; strychnia nitrate 1-60 gr. hypodermically a day, increasing 1-6 each dose up to 1-10. The Author gives a detailed report of the progress of the case, with the following result: Tension normal, vision 20-30, pupillary reaction good, reads Jaeger No. 2 at three feet. Discharged from the hospital, treatment discontinued except 1-60 grain strychnia three times a day. Three months later he had gained thirty pounds in weight, general health good, only discomfort with eyes is not seeing well at night and only seeing straight ahead, as he expressed it. Vision was telescopic and 20-20 in each eye. Pupillary reaction and tension normal.

H. G. G.

A Case of Microphthalmus with Upper Lid Cyst.

MAY, Dr. Charles H., and HOLDEN, Dr. Ward A. (*Archives of Ophthalmology*, Sept. 1906).—The condition of the patient one week after birth was: Right eye normal. The left eye presents a large cystic protrusion, pink in color, occupying the entire palpebral aperture and appearing to consist of the everted conjunctival surface of the upper lid. The mass measures 18mm in width, 12mm in height, and projects 10mm. It contained a clear yellow fluid. Beneath the cystic mass a microphthalmic globe could be seen, the cornea of which measured 7mm in width, and 6mm in height, flattened and trans-

parent. The pupil was pear-shaped with the narrow extremity pointing upward and inward, complete posterior synechia, the area of the pupil grayish and opaque (cataract) so that no view of the interior of the eye could be obtained. Five months later the mass had grown slightly. Operation—The conjunctiva covering the cyst was divided transversely and separated from the mass by blunt dissection. The separation was effected quite readily everywhere, except at the equator, where there was a direct connection between the mass and the eyeball. This connecting portion was of dark color, and was found upon division to be formed partly of pigmented and partly of nonpigmented tissue. At the attachment a probe could be passed into the eyeball for a distance of 15mm., but it was impossible to determine whether between the tunics of the eyeball or into the vitreous. A little over a month later the small eyeball had enlarged and there was a great deal of difference between the size of the globes on both sides. Pathological report—From a point on the upper inner surface, near the equator, of the small eyeball, issued a narrow stalk which expanded into a large tumor lying behind the upper lid. Development—Evidently a knuckle of the secondary optic vesicle forced its way upward into the overlying mesoblast and, continuing to develop in extent, formed a mass of rudimentary retina which is surrounded by a fibrous sheath continuous with the sclera. The stalk is a tube of retina with a narrow lumen connecting the cleft like cavities of the tumor with the vitreous chamber of the eyeball. The lumen surface corresponds to the inner surface of the retina within the eye. The stalk is surrounded by a layer of pigment continuous with the pigment epithelium, and is enclosed in a fibrous sheath continuous with the sclera. On passing from the stalk into the tumor proper the relations of retina, epithelium, and outer fibrous coat are modified. The pigment epithelium surrounding the outer surface of the retina has mostly disappeared, and the fibrous coat and the retina pass one into the other without any line of demarcation. But where the fold of the retina has allowed the fibrous sheath to pass into the central portion of the tumor, pigment epithelium has been carried in also in several places, and now lies in an anomalous position as regards the retina. The rudimentary retina in this case is composed simply of a network of glia fibres and scattered nuclei, enclosing numbers of ganglion cells, large and small. There is

no division into layers and there are no distinct outer and inner limiting membranes. The writer calls attention to the numbers of rosette formations which are found in some gliomas and in some retinas of arrested development, their genesis and development are well shown in this case. The primitive neuroepithelial cells, which compose the secondary optic vesicle, have become differentiated into spongioblasts, which, attaining their full development, have formed, on the one hand, glia cells and fibres, and, on the other, ganglion cells.

H. G. G.

Observation on Methods of Advancement.

COGAN, J. E., Ohio, in an illustrated article (*Ophthalmic Record*, August '06), describes a new operative method which he has used with very satisfactory results. After commenting on the weak points of the methods of Worth and Stevenson, he claims that his method eliminates the danger of perforation and is easy of execution.

In describing it he says the muscular sutures are the same as those of Stevenson. Instead of scleral suture each one is passed around the cornea and tied at the opposite side of the eye, the last two stitches going through the superficial sclera and tied with a surgeon's knot. The operation is completed by bringing one of the armed muscular sutures forward as shown in an illustration through the episcleral tissue out through the conjunctiva, and where it is tied with the other muscular suture, thus closing the wound. There are no stitches to pull out and the eyeball yields support.

O. W.

Concerning the Signs in the Retina of Persistent High Arterial Tension and Their Diagnostic and Prognostic Report.

DE SCHWEINITZ, G. E., Phila. (*Ophthalmic Record*, August, '06), writes at length of high arterial tension in the retina. He describes the signs as *suggestive* and *pathognomonic*. In his opinion the suggestive signs are, uneven caliber and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, an unusually light color of the breadth of the artery and alterations in the course and caliber of the veins.

The pathognomonic signs include changes in the size and breadth of the retinal arteries so that a beaded appearance is produced; distinct loss of translucency; decided lesions in the arterial walls, contractions and dilatations of the veins and par-

ticularly indentations of the vein by the stiffened arteries, edema of the retina and hemorrhages which sometimes assume a drop-like form. That these signs are not the result of old age is proved by the following conditions, which, in the experience of the writer, have been seen very early. First—A corkscrew appearance of arterial twigs which skirt the macula, or one or more small branches which arise from the larger vessels. Second—A flattening of a vein where it is in contact with an artery. Third—The nerve head has a dull, red appearance. In conclusion he refers to the necessity of accurate instrumental measurement of the arterial tension and describes two instruments which are clinically reliable for that purpose. O. W.

STANDISH, Myles, in an illustrated article (*Ophthalmic Record*, August, 06), on silver preparation, refers to the result of treatment in the Massachusetts Eye and Ear Infirmary, as follows: Of 50 cases treated with nitrate of silver 6 had subsequent corneal infection, of 150 cases treated with protargol 3 had subsequent corneal infection; of 64 cases treated with argyrol, not one had subsequent corneal infection. In cases of gonorrheal conjunctivitis with clear cornea in adults 66 per cent. had subsequent corneal infection when treated with protargol. Treated with argyrol 69.5 per cent had subsequent corneal infection.

In summing up, the result is—recovery, 58 per cent; absolute failure, 7½ per cent. The local treatment was frequent cleansing of the lids and free instillations of a 25 per cent solution of argyrol every two or three hours. In 14 cases a 50 per cent solution was used.

In conclusion Standish says that modern silver preparations are efficient in the control of gonorrheal infection of the conjunctiva and that they have greater bactericidal properties than laboratory experiments would lead us to expect. O. W.

Recent Advances in Ophthalmologic Therapeutics.

MARPLE, W. B. (*Ophthalmic Record*, September, 1906), writes of recent advances in ophthalmologic therapeutics and new local anesthetics. Stovain and Alypin he regards as rivals of cocain. Alypin produces a local anesthesia in one minute which lasts for two minutes. It does not dilate the pupil but causes vaso-motor dilatation. Stovain causes smarting and produces a local anesthesia in two or three minutes which lasts

from eight to ten minutes. He refers to the numerous preparations of silver salts introduced to take the place of nitrate of silver, but agrees with Dr. de Schweinitz that in gonorrheal affections there is no satisfactory substitute for, nitrate of silver. Quoting from Paul, of Uthoff's Clinic, Breslau, concerning the use of Romer's pneumococcus serum in *ulcus corneae serpens* of fifteen cases treated six were cured, and seven were failures, the injections being from ten to fourteen c. c. every day or every other day for four or five days. The writer also refers to the successful use of radium and the Roentgen Ray, and in conclusion calls attention to Dr. J. Roger's treatment of exophthalmic goitre by a special serum.

O. W.

Syphon Eye Compress.

GRIFFIN, O. A., (*Ophthalmic Record*, October, 1906), describes a syphon eye compress which he considers to be more practical and satisfactory than the bag ordinarily used. The apparatus consists of a small rubber bag, to which two tubes are attached. Through one of these a small stream of water is syphoned into the bag; through the other it escapes, and thus the compress is kept at a uniform temperature. In order that the water should not flow out too quickly, a piece of hard rubber tubing of small caliber is inserted into the end of the discharge. Two pitchers of equal size are used, one to supply the water, the other to receive it. The length of time the stream will flow depends upon the capacity and relative positions of the pitcher. The temperature is maintained by the additions of hot or iced water, as may be desired. In order to retain the applied temperature a piece of moistened gauze two inches square is placed under the bag, while the latter is held in place by a piece of paper.

O. W.

Black Cataract..

SMITH, W., Texas, (*Ophthalmic Record*, October, 1906), reports an unusually interesting case of black cataract. The patient, a woman 71 years, healthy and well preserved, had been stunned by a flash of lightning, from which she appeared to recover, but on the same day was stricken with paralysis of the right side, which rendered her helpless for several months. As she recovered, dimness of the right eye became noticeable, and increased as years passed by. She was treated unsuccessfully for cataract before consulting Dr. Smith, who watched the ripening process for two years.

The cataract was removed through an incision which involved nearly one-half the length of the cornea. The vitreous was unusually fluid, and the cataract so insecure that the slightest touch with the cystotome nearly displaced it into the vitreous. A clear pupil was obtained, but objects held on the temporal side only could be seen. On the fourth morning after the operation the wound was torn open and the iris prolapsed in consequence of the patient having removed the bandage. The eye was thoroughly irrigated with antiseptic solution, and the iris replaced. It healed slowly, but completely. Examination of the fundus revealed progressive optic atrophy of the temporal side of the disk.

The capsule contained a large black nucleus. The patient can read small print with a plus 10 sphere in the nasal field.

O. W.

A Case of Septic Infection Following Ophthalmia Neonatorum.

STEPHENSON, L. (*Ophthalmic Record*, September, 1906), describes a case of septic infection due to absorption of pyogenic organisms and their toxins from inflamed eyes. The patient, an infant seven days old whose lids, although swollen, were everted without difficulty, showed the stain of previous treatment with preparations of silver. No cocci of any kind could be found in the discharge from the eyes. The corneae, although milky, were not ulcerated. Eighteen days later both corneae had perforated, and each iris had prolapsed. Within a week swellings appeared on various parts of the body. Five months later the left eye became staphylomatous and was enucleated. The child had been well nourished throughout. The writer concludes by remarking that the case was an instance of antepartum ophthalmia, a condition which is more general than is usually supposed.

O. W.

Extraction of Cataract in the Capsule.

CHENEY, F. E., M. D., Boston, Mass. (*Ophthalmology*, October, 1906), after reviewing briefly the two papers by Major Henry Smith, of India, and quoting the technique therein suggested, names three variations in the ten cases reported. First—The speculum is not removed until the operation is completed. Second—Pressure is applied by means of a spatula instead of a strabismus hook. Third—The cut is not completed as far forward as suggested. The full histories of the ten cases are given and the results are analyzed. In all,

except one eye lost by infection, the visual results are satisfactory and average better than the same number of ordinary extractions recorded so soon after operation. The duration of continuous pressure for rupture of the suspensory ligament and presentation of the lens, so far as reported, was from one to four minutes, an average of about two minutes. From the surgeon's standpoint the results in three cases were ideal, i. e., no loss of vitreous, no synechiæ, no injection during healing, vision equals 20-20. These were all cases in which the iris was tremulous before extraction, and very little pressure was needed to bring the lens into presentation. Even with some loss of vitreous in two cases the vision, after recovery, was 20-20 and 20-40. Of the remainder, in three cases the iris became adherent along the whole wound, a result which probably would not have occurred had the usual incision been made along the limbus. In two of the cases the wound separated extensively, incarceration of the iris took place, and a prolapse of vitreous seemed threatening. The author also mentions two cases operated on by Dr. E. E. Jack, in which a similar complication was met with, even after iridectomy. The conclusion drawn is that a small per cent of lenses may be extracted in capsule advantageously, but that the more common procedure seems to be generally preferable. A. F. A.

**The Extraction of the Lens in Capsule As a Method of Procedure
In Case of Immature Cataract.**

STANDISH, Myles, Boston, Mass., (*Ophthalmology*, October, 1906), says that in order to avoid the delay and loss incident to the natural development of a cataract and also to lessen the risk and uncertainty of an operation upon the immature lens, the writer has made trial of the method of operation upon immature cataracts suggested by Dr. Smith, of India. Three cases are reported. First—A woman of 65 years, with dense nuclear opacity, but otherwise soft lens. No complication followed, and corrected vision sixteen days after operation was 20-70. Second—A man of 45 years, with large opaque nucleus, the rest of the lens being clear. Recovery followed without incident, with corrected vision equals 20-50. Third—A woman of 57 years, diabetic, with both lenses nearly opaque throughout. The expulsion of the lens was very difficult and with some loss of semi-fluid vitreous. Only slight iritis and conjunctivitis followed the operation. The corrected vision twelve

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days after operation was 20-100. The results in all these cases were probably better and achieved with less distress to the patient than by any other method. A. F. A.

Ptosis: Its Diagnosis and Value As a Localizing Symptom.

BRADBURN, Alison, F. R. C. S., Southport, Lancashire, England. (*Ophthalmology*, October, 1906.)—As ptosis is a symptom of many affectionis, frequently an early and solitary one, an effort is made in this article to increase its value as a guide to differential diagnosis. To do so, all cases are classified as congenital or acquired, and each class is further subdivided according to its cause and condition. Congenital ptosis may be due to absence or deficient development of the muscles or nerves, or associated with sympathetic movements of the lower jaw. Acquired ptosis may be classified according to the structure at fault, e. g. 1, the lids; 2, the levator, or the lesion may be (3) central, or 4, of constitutional origin; or 5, it may be due to some lesion situated in the track of the third nerve; or 6, due to some affection of the sympathetic nerve. Under 3 the drooping of the lid of one eye only would distinguish ptosis of central origin from any lesion situated elsewhere in the brain, except an occasional ptosis from disease of the pons. Under 4 the ptosis is generally bilateral, localizing symptoms pointing to lesions in the oculo-motor tract of the third nerve are absent and other signs of disease of the central nervous system can be found by careful examination. Under 5 the situation of the lesion would give classification (a), nuclear—when the entire nucleus is involved the ptosis will be accompanied by total ophthalmoplegia, which might also occur from a lesion of the third nerve itself further forward, but in that case there would be signs of involvement of neighboring structures, such as hemiplegia, anesthesia, etc. Thus a ptosis occurring without any localizing signs or accompanied by isolated symptoms pointing to nuclear lesions is due to a lesion affecting the nuclear region of the third nerve in the floor of the fourth ventricle. A one-sided ptosis without any other focal symptom is probably nuclear, except rarely a cortical affection. A ptosis occurring simultaneously with a paralysis of the superior oblique or along with an affection of some of the other groups of the third nerve nucleus would give presumptive evidence of a nuclear origin as the cause. (b.) Fascicular. The close contact of fibers of the third nerve and

the pyramidal motor tract at the anterior border of the pons makes it evident that a lesion affecting these fibers would also implicate the motor tract, producing along with the ptosis a hemiplegia of the side opposite to the ptosis. This may affect all or a part of the fibers, but the one to the levator palpebrae is the most commonly affected. This association of ptosis with hemiplegia is a localizing sign of great value, provided the two conditions occur simultaneously. Otherwise they may be due to two lesions at different points. (c.) Basal. The fibers of the third nerve pass through the sphenoidal fissure in close relationship to the first division of the fifth nerve, hence a lesion affecting this part of the third nerve would be associated with signs showing involvement of neighboring structures. There would be complete ophthalmoplegia, edema, proptosis, venous engorgement of the ophthalmic veins, eyelids, etc., anesthesia of superior orbital region, optic neuritis, etc. (d.) Sphenoidal. This would be distinguished from basal lesion by absence of edema and proptosis and from a purely orbital lesion by the implication of the fourth nerve, the basal, frontal and lacrimal divisions of the first. (e) Orbital. This would be associated with paralysis of the superior rectus muscle. 6. Ptosis sympathetica is due to paralysis of fibers of Müller's muscle, innervated by the sympathetic. The diagnosis would be made from concurrent signs of involvement of the sympathetic, viz., contracted pupil, enophthalmos and symptoms of vaso-motor paralysis of the same side of the face and head. These symptoms have been found in lesions of the corpus striatum. A. F. A.

Traumatic Enophthalmos.

LUKENS, Charles, M. D., Toledo, Ohio (*Ophthalmology*, October, 1906) reports the following case: The patient, a man of 54, was stabbed in the face three times with the blade of a small knife and then thrown down stairs, April 27, 1904. The blade entered through the left upper eyelid, near its center. The skin of the lid had been closed by several stitches. The lids were swollen and very prominent and immobile. The orbital tissues were tense and there was marked enophthalmos. On the under surface of the lid were transverse gaping cuts extending through the cul-de-sac. The cornea was uninjured, the iris and anterior chamber clear, vision reduced to perception of moving fingers. An artery had been ruptured and the

orbit fractured, communicating with an accessory sinus, with bleeding of the nose for ten days. The patient was placed in bed, iced cloths, boric acid and atropin used. The conditions were soon relieved and the patient left the hospital at the end of two or three days. He was not seen again until June 4, 1904, with the following conditions present: The left upper eyelid drooped, nearly covering the eyeball, the superior cul-de-sac was partly obliterated by cicatrization, the lid furrowed at the site of the wound and drawn up and in, producing a tendency to entropion. The action of the levator was very feeble, the eyeball dislocated 5 or 6 mm. back of its normal position, and 2 or 3 mm. below it and the eye was rotated up about 30 degrees, and out about 20 degrees. On palpation the eye was found to be held in place firmly by a resistant mass extending from the eyeball to the floor of the orbit. The patient could rotate his eye about 10 degrees horizontally, and not over 5 degrees vertically. The pupil was about 2 mm. in diameter and responded feebly to light. Vision was 1-60 of normal. The vitreous was hazy and the fundus invisible. The tension was normal. The patient reported that the sunken condition was first noticed when the swelling subsided. The orbital fracture, if direct, was in the roof, although the fixing mass was in the floor, which suggested an indirect fracture in this location. From the study of this case and seventy-seven others the following conclusions seemed warranted: Enophthalmos may occur—first, directly, when an extensive depressed fracture of the orbit has occurred, thereby enlarging its capacity, the eyeball is then pressed backward by atmospheric pressure; second, indirectly, through a traumatic nerve lesion, producing atrophy of muscular or orbital tissue; third, by cicatricial retraction following an inflammation of the orbit. Of these three classes the orbital inflammatory group easily takes the lead.

The enophthalmos usually takes place immediately on the subsidence of the inflammation, usually within two or three weeks. The most reasonable explanation seems to be the absorption of orbital fat due to the confined pressure. A brief abstract chart of sixty-two reported cases is appended, as is also an illustration.

A. F. A.

Foreign Bodies in the Anterior Segment of the Eye and Their Removal.

BRUNER, William Evans, M. D., Cleveland, Ohio (*Ophthalmology*, October, 1906) reports four cases. Case 1—The patient, 40 years old, had had some bulbar congestion for a week, and had had several similar attacks before. Resting on the iris, near the pupillary edge, was what looked like a piece of rusty steel, bound to the iris by lymph. A fine linear scar was seen in the lower outer portion of the cornea. He had been struck in the eye with a piece of steel ten years before, followed by two weeks of inflammation. The inflammation at the time of the call was increasing, and the vision was diminishing. The Hirschberg magnet was introduced, but failed to start the object. The iris forceps was introduced, the body disentangled and removed, followed by a good recovery. This case illustrates the fact that a foreign body in the lens is less liable to produce injurious symptoms or sympathetic inflammation than when located in other parts of the eye, yet occasionally they are rapidly fatal.

Case 2—The patient, 39 years old, related that twelve days before he had been struck in the left eye by a small piece of steel. There was very little pain, but the sight immediately became blurred and the eye had been reddened ever since. Examination showed a slight ciliary injection, a small linear scar in the cornea, some lens matter in the anterior chamber, the iris normal and the lens partially cataractous. Vision equalled fingers at two feet. A small piece of steel was seen in the posterior part of the lens. The particle was drawn out of the lens by the Haab magnet. A small incision was made and the Hirschberg magnet extracted the steel from the anterior chamber. Recovery was prompt and uninterrupted. A month later vision was 3-45.

Case 4—A foreign body penetrated the lens and in a few hours caused a severe inflammation with pus in the anterior chamber. The foreign body was drawn out of the lens by the magnet and extracted from the anterior chamber with the Hirschberg magnet, the pus escaping at the same time. Recovery was prompt and in five days he left the hospital.

A. F. A.

Treatment of Diseases of the Duct Without Operation.

SNYDER, Walter Hamilton, M. D., Toledo, Ohio, (*Ophthalmology*, October, 1906) gives the full technique of his treat-

ment and hopes that better methods may make operative measures less imperative. The punctum is dilated progressively and the sac washed out. Then a weak argyrol solution is injected with considerable downward pressure in the hope to force the mucus and thickened discharge into the nose. This is repeated every three days. Warm alkaline sprays are also used in the nose, followed by an oil spray if there is a tendency to crusts. The author probes much less than formerly, and seldom uses a probe larger than the number seven.

A. F. A.

Herpes Zoster Ophthalmicus.

SULZER, G. A., M. D., Portsmouth, Ohio, (*Ophthalmology*, October, 1906) reports the following case: The patient, a man of 65 years, had complained of neuralgic pains in and about the right eye, nausea and general weakness for two days. The distance vision was 10-200, the conjunctiva inflamed, the pupil round and 5 mm. in diameter, the dilatation due probably to the use of atropin, the tension was normal, the cornea anesthetic and clear except for several fine vertical linear superficial abrasions, the fundus and media normal, no central or peripheral scotomata, the field of vision normal. Six days later he presented a tremendous swelling and redness of the whole right side of the head from the vertex to the neck, covered with vesicular eruption over the area supplied by the supra-orbital terminus of the frontal branch of the ophthalmic nerve. The lateral limits of the eruption were the temple and the middle line of the scalp, and anteriorly from the margin of the upper lid to a line covering the posterior temporal branch of the external carotid artery. A moderate iritis developed. In ten days the swelling of the lids had subsided and the eyeball was found to be fixed, the pupil dilated and not reducible by eserine. In addition to the paralysis of all the external muscles of the eyeball the levator palpebrae was paralyzed. At the end of five weeks from the onset of the disease the inflammation had largely disappeared and the cornea was found to present a peppery, parenchymatous infiltration with an almost clear small central area. Ten days later the patient had an attack of hemiplegia of the right side of the body, from which he had largely recovered two weeks later, when the eye was found to be perfectly white, the cornea hazy and the ocular muscles to have recovered their normal

functions, except the sphincter iridis. Several months later the patient died from the cerebral hemorrhage. The views of various writers as to the pathology of this disease are quoted and four special points noted. 1. The unusual ocular manifestations early in the disease. 2. The irritation of the nasociliary nerve and the freedom from vesicles of the cornea and conjunctiva, however, associated with interstitial keratitis. 3. The complete paralysis of all external and internal ocular muscles. 4. The complete recovery from paralysis of all the muscles except the sphincter iridis. A. F. A.

Inflammation of the Eyes Due to Infection from Hay Fever Conveyed by Tobacco Smoke, With Report of Cases.

WRIGHT, J. W., M. D., Columbus, Ohio (*Ophthalmology*, October, 1906) recounts how a whole family was infected by tobacco smoke from the hay fever sufferer and quotes how two people were infected with smallpox by the smoke from the burning of an infected mattress. He calls attention to the possibility of communicating other diseases, like tuberculosis, by the dust of smoke. A. F. A.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(GREAT BRITAIN AND THE ENGLISH COLONIES.)

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Obstruction of the Central Retinal Vein.

VERHOEFF, F H.—(*Ophthalmic Review*, Dec. 1906), after speaking of the variance between the diagnosis made by the ophthalmoscope and the pathological findings in cases of obstruction of the central vein, reports six cases of his own and reviews the twelve other reported cases, with the conclusion that in all but two cases the obstruction was due, not to a thrombus as diagnosticated, but to an endophlebitis proliferans.

In a large proportion of the cases examined anatomically, in which this diagnosis has been made, the central vein has been found patent and comparatively normal, while in some of the cases it is probable that a coagulum due to the fixing agent or the appearance produced by a longitudinal section of the vein wall has been mistaken for an obstruction.

An analysis of the reported cases goes to show that the obstruction in the vein was certainly due to thrombus in only two cases.

An analysis of the reported cases not due to thrombus shows the histological evidence was not only insufficient to show it was due to thrombosis, but indicated that it was due to endophlebitis proliferous. The obstructing mass consisted either entirely of connective tissue or partly of proliferated en-

dothelial cells, and contained no remains of degenerated blood.

The average age was 58. Albuminuria was present in three cases. In five cases, definite signs of arteriosclerosis. The presumptive prognosis in regard to life must be unfavorable. In all except one case, the obstruction was situated either within or more often behind and partly within the lamina cribrosa.

With two exceptions, glaucoma was present in the cases examined anatomically. In all but one case the glaucoma was monocular, which seems to justify the conclusion that the glaucoma was caused by the obstruction. This being contrary to the statements in many text-books, makes further observation necessary and important.

After giving the clinical features of his cases the author draws the following conclusions:

Complete obstruction of the central retinal vein, with the classical ophthalmoscopic picture of thrombosis of this vessel, may be produced by endophlebitis proliferans without thrombosis. The proliferation may involve the sub-endothelial tissue alone, or the obstruction may be completed by a more active endothelial proliferation into the lumen.

All of the cases anatomically examined in which obstruction of the central retinal vein has been attributed to non-septic thrombosis, can be explained by, and in all probability were due to, endophlebitis proliferans alone.

The so-called canalised thrombus of the central retinal vein is in the nature of a dissecting aneurism.

In certain cases obstruction of the central retinal vein may early give rise to acute glaucoma.

W. R. P.

A Clinical Lecture on Optic Neuritis and Its Relationship to Intracranial Tumors.

FLEMMING, R. L., of R. C. 'P. E., (*The Medical Press*, Jan. 16, 1907), in an excellent clinical lecture discusses: (1) The ophthalmoscopic and microscopic appearances of optic neuritis as found in intracranial tumor. (2) The nature of the tumors with which optic neuritis is most commonly associated and the bearing of the site of the tumor on the incidence of optic neuritis. (3) Treatment.

Under (1), he notes that optic neuritis is generally double, but may be more advanced in one eye, and this may indicate the side on which the neoplasm is situated. The retinal vessels are small, the veins engorged, swollen and tortuous, and small venous branches, normally unnoticeable, became large enough so that the veins appear unusually numerous. The disk is red, edges blurred, sometimes to such an extent that a +7 lens is required to focus the vessels. At edge of disk, the vessels bend backward towards the retina; in front they are covered with exudation. There may be numerous flame shaped hemorrhages in or near the disk. The neuritis may disappear or may go on to consecutive atrophy, connective tissue replacing the inflammatory exudation; producing inevitable and permanent blindness.

Sight may fail early, or a wonderful preservation of visual acuity may persist with a high degree of "choked disk." There is usually a narrowing of the fields for red and green and the normal disk scotoma is much enlarged.

Flemming has never failed in a case of marked optic neuritis during life to find definite microscopic changes in the optic nerves. There is a marked nuclear increase, due to proliferation of the nuclei of the neuroglial cells. The true neuroglia cells, not the mesoglia cells of Ford Robertson, are the ones which undergo distinctive changes, as follows: (a) Proliferation. (b) Marked increase in cell protoplasm and in the distinctiveness of the cell processes. (c) Granular cytoplasm vacuolization may be seen. (d) Enlarged nuclei with definite karyokinetic figures, which stain more faintly than normal. This hypernucleation is best marked near the outer portion of the optic nerve.

Flemming reviews the chief theories of optic neuritis; Von Graefe thought it was due to venous obstruction from increased intracranial pressure especially affecting the cavernous sinus. This theory is untenable because of the free anastomosis with the facial and orbital veins.

Broadbent, Manx and others believed that the great pressure of lymph in the intersheath space might cause the neuritis; but we find that even in extreme cases of optic neuritis, the distension of the intersheath space may be very slight.

Schmidt included the lymph spaces between the intersheath space and the lymphatic channels in the nerve and pial sheath. In referring to these three theories it is pointed out that a very small tumor may produce a most intense optic neuritis, while a very large one may cause none at all.

Hence, Leber thinks there is an irritant of some kind in the cerebro-spinal fluid; while Galezowski, Brailey, Edmonds and Juler believe that the irritant is in the brain tissue itself and is conducted directly downwards to the optic nerve.

Schweigger, and Hughlings-Jackson suggest that the inflammation is due to a reflex stimulation of the vaso-motor nerves of the disk.

Deutschmann closely associates meningitis with optic neuritis, while Goers believes the optic neuritis is a descending neuritis which is present in intracranial tumor cases, and often associated with meningitis.

Flemming admits that it is difficult to say where the inflammation begins—whether at the papilla and ascending from there, or descending from the brain to the papilla. But there is no evidence that it is an ascending neuritis, and everything points to the correctness of the toxic theory, and, arguing from the hypertrophy of neuroglial cells which occurs in general paralysis of the insane, and other diseases which are certainly toxic, the changes just described favor a toxic hypothesis.

There are three kinds of so-called optic neuritis associated with intracranial tumor. (a) "Choked disk" due to great intracranial pressure and in which sight may be long retained. (b) True inflammatory optic neuritis without much swelling of the papilla, and (c) an extreme degree of papillitis not due to mere choking of the disk. The 2nd and 3rd varieties, Flemming believes, are of toxic origin and in these sight usually suffers early, and often severely.

Under (2) there is no question that a glioma, of all tumors, most constantly causes optic neuritis, and cysts and gummata come next in order.

Fully four-fifths of all cases of intracranial tumor are accompanied by optic neuritis. The cerebellum is almost never

the site of a tumor without coincident optic neuritis. Flemming thinks the figure of 90% often given, is too low.

Optic neuritis is common in tumors of the corpora quadrigemina. Tumors of the cerebral hemispheres generally cause optic neuritis, especially if the frontal lobes are involved.

Meningeal tumors more rarely produce optic neuritis, and it is rare to find it in tumors of the medulla, pons and corpus callosum.

(3) Regarding treatment—the best treatment is unquestionably to attempt an operation which relieves any pressure which may be present.

Trephining the skull is, and should be, carried out in all cases of intra cranial tumor where sight is threatened, whether we can localize the tumor or not, and it is a more satisfactory operation than trying to tap the intersheath space behind the eye-ball.

Lumbar puncture might in certain cases replace the more dangerous trephining operation. Flemming does not believe the relief of pressure is always necessary, and it is possible that the trephining operation and oozing of cerebro spinal fluid may, as Horsley thinks, help in blighting the tumor. It does not always help visual acuity, but it does so in more cases than can be explained by the "choked disk" theory.

If the toxic theory is the correct one, we know as yet no remedy to apply which can do any good as an antagonizing agent.

"Errors of Vision as a Factor in Motor Car Accidents."

CLEMENTS, CECIL (*British Medical Journal*, Dec. 8, 1906), cites five cases in which refractive errors seem to be responsible for motor accidents.

An ideal driver, he says, must be an excellent judge of space and distance, keenly on the alert to seize every opportunity, and ready to act quickly in any emergency. All these qualities call for perfect and binocular vision, and must of necessity cause considerable nerve and eye strain even by day.

He thinks the excuse for accidents that "somebody blundered" insufficient, and says we have a right to know "the

reason why," so that in the future, precautions can be taken to prevent their occurrence.

He cites one case, a man aged 39, who at the end of a long distance race, became confused because of partial loss of vision and examination revealed the fact that his vision was reduced to 6-12 and 6-5 with an S+3 D. lens.

A second case, one of latent divergence, due to the eye and nervous strain necessitated in driving a car, the divergence became real and diplopia developed.

The third case, a man 23 years of age, suffered from spasm of accommodation. His vision was 6-24 in each eye with a-1 D. S. equals 6-5 but under atropin, +2.00 spherical in each eye was required.

Case four, giving a history of a narrow escape from a serious accident while riding in a car. He had been troubled most of the day, during the latter part of which, he made one or two slight errors in steering, and toward dusk crashed into a hedge instead of turning a corner. On examination, he found the patient to have one and one-half diopters of hypermetropia.

Case five, a physician on hearing of the above cases, said, "I wonder if my vision will account for my bad driving of late." Examination showed him slightly astigmatic and with a difference of +0.75 hyperopia between the two eyes.

In each of the above cases, correcting glasses relieved all symptoms.

In conclusion, a word of warning about motor goggles will not be out of place here. Goggles with bowed glasses should never be used under any circumstances, and for this reason—though theoretically they are similar to plain glass, practically they are really myopic glasses of varying strength. Hence, they may just turn the scale in favor of spasm of accommodation. Case III. had been wearing goggles of this kind. Flat, glazed goggles should be worn, and, if required, they can be replaced by the requisite correcting lenses, care being taken that the existing goggles are properly centred. No smoked goggles should be worn after sundown, as they are liable to create a false dusk and so increase the existing danger.

Tenotomy of the Inferior Oblique and Consideration of the Conditions That May Call for the Operation.

Duane, Alexander, at the Toronto meeting of the B. M. A., after describing the technique of the operation, which consists in a division of the tendon of origin through a cutaneous incision, discusses the condition which may call for the operation, namely:

- (1) Conditions simulating spasm of the inferior oblique
 - (a) Complete stationary paralysis of the superior rectus of one eye.

Fixation with the other eye. No true spasm.

- (2) True secondary spasm of the inferior oblique.
 - (a) Partial paralysis or insufficiency of the superior rectus, causing pronounced secondary deviation (upshoot) of the other eye due to spasm of its inferior oblique.

(b) Paralysis of a superior oblique or some muscle, causing secondary spasm of the inferior oblique in the same eye.

- (3) Primary spasm of the inferior oblique. No operation should be done unless

- (a) The condition was permanent and stationary, and
 - (b) The symptoms were so marked as to call for interference.

Perforating Wounds of the Eye.

SHAW, DR. CECIL, Belfast (*British Medical Journal*, Dec. 29, 1906), gives the notes of a case of perforating wound of the eye ball, with complete destruction of the iris and retention of vision.

The patient was an engine driver, aged 23, who was removing a bicycle tire, when the wrench slipped and flew out, striking the right eye, cutting the cornea from edge to edge a little below the center. When the blood in the anterior chamber cleared off, it was seen that the iris had completely disappeared, leaving the lens in place, but injured at its lower edge. The wrench was particularly sharp and rough-edged and probably caught the iris and tore it out.

All signs of irritation passed off in a month, but some floating opacities remained in the vitreous. The man was able to return to his work in six weeks with vision of 6-18 and 6-12 partly in the injured eye.

The Pathology and Treatment of the Ocular Complications of Gonorrheal Infection.

McCETTLER, W. J., M. D. Ch. M. Aberd. F. R. C. S. Edin. (*The Lancet*, Jan. 12, 1907), gives the four signal successes in the campaign against gonococcal invasion. The first was the recognition of gonorrhea as a distinct pathological condition by Ricord in 1831; the second, the discovery of the gonococcus by Neisser and Bouchard in 1878; the third, the fulfilment of Koch's postulates by Bumm and later workers; and the fourth, the discovery of the influence of silver salts by Credé in 1880.

The author gives figures showing the amount of blindness due to gonorrhea; and the great benefit derived by the use of the Credé method.

Like the urethral affection, he says we may divide the clinical history of ophthalmia into the several stages of incubation, copious discharge, and ocular gleet. He states the incubation period of ophthalmia as generally given in text books is greatly at variance with that of urethritis. Some go so far as to say that the symptoms usually begin within a few hours after infection; Whereas, in the urethra "it rarely occurs that the period of incubation is less than two days." The discrepancy, the author thinks, is mainly due to the difficulty, or the impossibility, of ascertaining the exact moment of incubation. The rubbing of the lids is an almost unconscious act. "Some years ago it was a legitimate treatment of inveterate trachimatous pannus to inoculate the eye with gonorrheal matter, and where that was a legitimate treatment of inveterate trachomatous pannus of 60 hours. It is, however, becoming increasingly clear that we may have a true metastatic or endogenous infection due in some instances to the presence of the organism and in others to that of a toxin." In most of his cases the gonococcus was found, but in some it was absent. Giani proposes to classify such cases as paragonorrheal, in the same sense as Fournier grouped the parasyphilitic lesions.

In speaking of iritis he says we have a well defined complication not dependent on the actual presence of the microbe in the lesion, invariably associated with posterior urethritis, and generally with arthroses. Iritis he believes a commoner

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complication than is generally supposed. The presence of gonorrheal rheumatism is exceedingly likely to cause its being mistaken for ordinary rheumatic iritis.

For treatment he relies more on protargol than any of the other substitutes for silver, but thinks the frequent treatments (half hourly) disadvantageous, when three daily applications of silver will give as good, if not better results. In adults he always divides the external canthus, and does not neutralize the 2% silver solution. While he uses cold compresses, he suggests that heat may be more rational in view of increased acquaintance with the pathology of inflammation. W. R. P.

Myopia.

UHTHOFF AND SATTLER, (*The Lancet*, December 29, 1906), at the International Congress of Medicine held at Lisbon, in discussing the serious consequences of high Myopia, together with the treatment, spoke particularly of detachment of the retina and the various operative measures that have been proposed or adopted to improve this not infrequent condition. Professor Uhthoff reviews puncture of the retina, puncture or excision of a portion of the sclerotic, drainage by means of gold wire or catgut, electrolysis, iridectomy, the injection of substances with the object of exciting sufficient inflammation to make the retina adhere to the chorioid, cauterizations of the sclerotic with the thermo, or galvano-cautery, subconjunctival injection of solution of common salt or of eserine, either alone or combined with puncture of the sclerotic, and injections in the capsule of Tenon. Professor Uhthoff is unable to give even a qualified support to any of these proceedings and falls back upon measures of prevention largely hygienic. Professor Sattler was of the opinion that in childhood, total correction in myopia of ten diopters cannot be borne. Primary simple extraction of the lens in high myopia (18 diopters or more) is preferable to extraction performed with a preliminary iridectomy. He quotes an article by M. P. de Fort-Raulx, who has examined up to 1900 the accounts of all the reported cases in which the lens has been removed in high myopia. His conclusions are that the removal of the lens in high myopia does not render the

eye more useful, the patient often preferring to use the eye that has not been operated on; that if improvement is thought to take place in the first instance it is not permanent. Fuchs and others with large means of clinical observation have given it up.

W. R. P.

Toxic Amblyopia. (Tobacco).

DUNN, PERCY, in a lecture reported in *Lancet*, after referring to the history of the disease, cites a typical example of the condition with failing vision, pallidness of face, tremulousness of the hands and furring of the tongue, and history of constant use of tobacco. Although his vision is poor, the ophthalmoscopic findings are negative; but the diagnosis is made certain by testing the color vision and finding a central scotoma for red and green.

The pathology is in a large measure still a matter of speculation. Samelsohn regards the changes as a chronic interstitial inflammation of the papillo-macular bundle of fibers of the optic nerve immediately behind the disk, so that this disease belongs to the category of those included under the term of retro-bulbar neuritis.

Treatment resolves itself into two forms:

(1) Absolute prohibition of every form of tobacco habit, and (2) means to stimulate the gastric digestion and cure the chronic gastritis. This is accomplished by the administration of a tonic, preferably strychnine and iron.

A Contribution to the Study of Phlyctenular Ophthalmia.

NIAS AND PATON (*Lancet*, Dec. 1, 1906), by measuring the fluctuations produced in the opsonic indices in their cases, believe they can give support to the idea that infarctions of dead or attenuated tubercle bacilli are the causative factors.

Their results are based on an examination of 50 cases, in which 200 samples of blood were examined.

They find that the blood of a patient suffering from phlyctenular ophthalmia is markedly deficient in opsonic power to the tubercle bacillus, but not to other bacteria, such as the staphylococcus, at the outset; but if the patient be adequately treated the opsonic index rapidly rises and reaches a maximum coincidently with the healing of the ulcers. Then it falls rapid-

ly and in a few days is below the normal. At this low figure it will remain for an indefinite time and if a relapse occurs, the same sequence of phenomena will be reproduced. In a minority of cases, generally older and more vigorous subjects, the opsonic index as regards the tubercle will be found to have risen much above the normal. Here it will remain with temporary falls till healing occurs and then takes a terminal drop. There was not a single exception to the above course of phenomena.

The authors furnish several interesting charts of the opsonic index during the course of treatment. Tuberculin was not used in treatment because it would vitiate the results. The authors submit their results with the desire of having them verified or contradicted by other observers.

Treatment of Superficial Inflammations by Inducing Congestion.

RENNER of Munich, HESSE of Gratz, and OSTWALT (*The Lancet*, Dec. 29, 1906), have proposed and carried into effect a method of treatment to be practiced in various forms of ophthalmic disease. "It consists in inducing hyperemia or congestion at the seat of disease. The methods by which hyperemia is induced differ. Dr. Renner adopting compression of veins, Dr. Hesse local reduction of pressure, and Dr. Oswald the employment of dry heat. The first method is not easily applied to the eye. The venous system of the eye is protected in large measure by the bones of the orbit and pressure causing congestion can only be applied to the great veins of the neck. Accordingly, Dr. Renner proposes the placing of an elastic band around the neck, the pressure of which can, of course, to a certain extent be regulated, but it is obvious that many other parts, the central nervous system for example, which it may be particularly undesirable to supply with an unwonted quantity of blood, will also be changed. Nevertheless, he has obtained good results in keratitis and ulcers of various kinds. The plan proposed by Dr. Hesse with the same object in view seems more feasible. A cupping glass of small capacity is adapted to the contour of the lids, to which is attached a sucking pump or an elastic tube ending in a bulb containing mercury. Dr. Hesse found conjunctival hemorrhage could be caused by reducing the pressure from 750 to 100 millimetres. The lids being closed

the rarefaction of the air effected by lowering the bulb caused edema in a few minutes and lividity within half an hour. If the lids were parted and the reduction of pressure practiced the deeper parts were strongly affected, the conjunctiva becoming to a marked degree chemosed and the cornea hazy. This method of treatment is novel and may prove appropriate for the relief of many forms of ophthalmic disease affecting the superficial parts. The application of dry heat to the eye in inflammatory affections, especially of a chronic nature, has often proved efficacious, and Dr. Ostwalt exhibited at the Lisbon Congress an instrument to which he has given the name of "thermaerophore," by means of which a current of dry air heated to 150 degrees F. or more can be persistently directed upon the surface of the eye or ear."

The Preventive Treatment of Sympathetic Ophthalmia.

LAWSON, ARNOLD, F. R. C. S., Assistant Surgeon, Royal Ophthalmic Hospital, has endeavored to summarize the whole matter in the form of five questions and answers, as follows:

1. Can it be definitely stated of any wound of the globe that it will inevitably produce sympathetic ophthalmia in the other eye?

My answer to this would unquestionably be in the negative. One has, in the course of ordinary hospital practice, seen so many shrivelled stumps, which are the result of terrible lacerations in bygone years, and which have not in the past and do not in the present cause any inconvenience, that one is inevitably led to the conclusion that sympathetic ophthalmia is an accident to be dreaded and not a certainty to be foretold.

2. If not, what are the lines upon which a surgeon should decide upon immediate removal of the globe?

The complete destruction of the globe as a visual organ must necessarily simplify matters, and this would be an answer in some instances.

Secondly, the presence of suppuration in or about the wound would render the possibility of saving the eye remote, and would lead the surgeon to sacrifice the eye with little compunction.

Thirdly, the presence of a foreign body impacted in the

globe, which cannot be removed, and about the asepticity of which grave doubts are entertained.

Fourthly, extensive and lacerated wounds of the ciliary body, accompanied by prolapse and leakage of the vitreous, especially if not seen within twenty-four hours of the injury, and especially also in cases where the other eye is healthy and visually good.

3. What are the considerations which may decide him to attempt to save the eye?

In the last three examples given of cases where the surgeon would advise immediate enucleation some sight may be still retained when the patient comes under observation for the first time. In such cases, if the other eye is unsound or visually defective, it may be advisable to attempt to save the injured eye, provided:

(a) That the wound is seen immediately or very shortly after the injury.

(b) That the wound shows reasonable probability of being amenable to aseptic surgical measures, and that it can be satisfactorily closed without any entanglement of the ciliary body or vitreous.

(c) That, when a foreign body is impacted in the globe and is incapable of extraction without the complete, or almost complete, certainty of destroying the eye, such a body is known to be aseptic. This, for instance, would probably be the case in a wound caused by the lodgement of a game shot.

Further, any recent, cleanly-cut wound of the globe, if not of too extensive a character, and especially if not accompanied by prolapse of the uvea, or trespassing freely on the ciliary body, or accompanied by other injury which renders recovery of sight highly remote, should be cleansed and closed by aseptic sutures, and such wounds usually do very well and give rise to no complications. I may here remark that the sutures closing such a wound should be applied by using double-neededled threads, which should be passed from within outwards, taking care to pass the needle through the sclera only, whilst an assistant smooths away the uvea round the wound with a spatula. By employing this method all pressure on the globe which would probably squeeze out vitreous is avoided; and,

moreover, the inclusion of the uvea in the sutures, which is obviously undesirable, is the more easily prevented.

4. In the later history of a case, short of definite evidence of commencing sympathetic ophthalmia, what symptoms, if any, should decide the surgeon in advising enucleation?

This is a difficult question to answer. First, when an injured eye will not quiet down after prolonged treatment by all possible or available surgical methods, and is the subject of continued iridocyclitis, with or without the addition of glaucomatous tension, the danger of the supervention of sympathetic ophthalmia becomes a steadily increasing one.

Secondly, in other cases the injured eye may apparently become more or less quiescent, but the other eye continues very irritable, exhibiting great lachrimation and photophobia. Sympathetic irritation, as this train of symptoms is styled, is now understood to be simply the expression of a reflex neurosis, and does not necessarily portend the advent of sympathetic ophthalmia. Nevertheless, one cannot but regard the long continuance of sympathetic irritation as of bad omen, and a symptom to cause some anxiety. It should, in my opinion, evoke a reconsideration of the propriety if he counsels this step.

Thirdly, in hospital practice, and more rarely in private practice, the question of the time that convalescence must occupy becomes one of great importance to the patient. A tedious, prolonged course of treatment extending, may be, into several weeks, with a doubtful prospect of recovery at the end, would be a very serious matter to an artisan or poor clerk; each case must be judged on its own merits; but the surgeon is surely wise who looks at the question from the broad standpoint of a patient's needs and welfare in the future.

5. Are there any premonitory symptoms which may accurately be described as heralding the approach of sympathetic ophthalmia, and upon the advent of which a surgeon, by immediate enucleation, may prevent the onset of the disease?

Most unfortunately, it is here that our knowledge fails us. I know of no symptoms that can be thus accurately described. The advent of any of the usual clinical signs is sure evidence that the disease is already present. There is some consolation

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in the fact that if the presence of sympathetic ophthalmia is recognized in its earliest stage, it may often be controlled and a fair recovery obtained, but the very insidious character of its onset may cause the earliest signs to pass unnoticed, unless the patient is at the time under the close supervision of the ophthalmic surgeon, which is often the case.

Tubercle Filling the Eyeball.

SNELL, MR. SIMEON (Sheffield), at the meeting of the Ophthalmological Society, reported in the *Medical Press* a case of tubercle filling the eyeball in which the opsonic index was regularly taken. The boy, age 12, was previously treated for tubercular abscesses in the arm and leg.

The left eye was prominent and slightly larger than the right. Vision was lost. The interior of the eye was occupied by a mass of yellowish-gray material in which the retinal vessels were seen. Tubercle of chorioid and vitreous was diagnosed. Tuberculin injections of 1/800 m.g. were twice given. The eye became smaller and mass within was thought to be caseating. Enucleation was finally done, and the mass proved tubercular on examination, but no bacilli were found.

W. R. P.

Nyctalopia.

SNELL (*Medical Press*) reports the particulars of a family, several of whom had suffered from nyctalopia. The earliest ancestor who suffered was the patient's grandmother. Out of sixty-four descendants to the fourth generation, twelve were afflicted with nyctalopia, nine being males and three females. A peculiar feature was that the males had girls affected and boys healthy, and the females had boys affected and girls healthy.

W. R. P.

Cataract in Bottle-Makers.

SNELL, SIMEON (*British Medical Journal*, January 5, 1907), gives the results of an inquiry into the alleged frequency of cataracts in bottle-makers. He concludes that, though, as in other trades, there are men engaged in the bottle trade who undoubtedly do suffer from cataract, and who come under treatment for it, there is not sufficient evidence to show that they are liable to the affection to such an extent as has been asserted.

W. R. P.

Vaccination of the Cornea.

MENZIES AND JAMESON (*British Medical Journal*, January 26, 1907) report a case of accidental inoculation of the lower outer quadrant of the cornea by a fragment from a tube of Chaumier's lymph. On the fifth day there developed indistinctness of vision due to monocular diplopia. The small pin-head area on the cornea increased in size until it occupied one-fourth of the cornea. The chemosis and edema reached the maximum on the sixteenth day, then diminished gradually for ten days. On the twenty-sixth day the epithelium began to spread over the denuded area of the cornea. Recovery was retarded by a secondary ulceration of the afflicted area. The vision, 6/6 before the inoculation, was reduced to 6/18 at the end.

The main symptoms were photophobia, epiphora and pain, mainly iritic. The eye was kept clean throughout by means of warm boric solution. Atropin was used to control the iritis pain. Argyrol was used as a possible means of destroying the vaccinal poison and continued throughout the acute stage.

W. R. P.

The History of Spectacles.

The following, taken from the *British Medical Journal*, is of interest: "At a recent meeting of the Berlin Society of the History of the Natural Sciences and Medicine, Professor Julius Hirschberg presented a communication dealing with the history of the discovery of spectacles. He said that lenses for the improvement of the visual power were unknown among ancient peoples, whether Egyptians, Greeks, or Romans. They knew and used the art of polishing glass and rock crystal, but they were unacquainted with the use of these substances as aids to the eye. This is shown by many passages in Pliny and Seneca. The Emperor Nero had a smaragdus which he used as an eyeglass, but it is not clear whether or not it was a concave lens. The Chinese and Arabs had no earlier knowledge of spectacles than Europeans. The Chinese, indeed, long before the Christian era, had various kinds of concave mirrors, but they did not use them as spectacles. The statement of a French investigator that spectacles are an ancient discovery of the Chinese is erroneous, and, according to Professor Hirschberg, it is certain that spectacles were introduced into China from Europe in the fifteenth century. In the Talmud

there is no mention of spectacles. The first certain reference dates from the year 1270. The Englishman, Roger Bacon, seems to have been the first who did anything towards the discovery of spectacles. He lived from 1214 to 1294, studied at Oxford and Paris, and taught at Oxford, where his learning gained for him the name of Doctor Mirabilis. He determined the position of the focal point in spherical concave reflectors, and gave directions for the making of parabolic burning glasses. In 1267 he had to clear himself from a charge of being a magician. He did this in his *Opus Majus*, in which he set forth his numerous optical experiments and discoveries. In it he speaks of magnifying glasses, which he said were useful to old people by making them see better. We hear in this book for the first time of the magnifying glass and its use. The actual discoverer of spectacles was probably Salvina degli Armati, a Florentine nobleman who died in 1317. Much was done for the popularization of spectacles by the Dominican friar, Alexander von Spina, who died in 1338. The spectacles first constructed were convex, and there is proof of their use since the middle of the fourteenth century. We hear first of concave glasses for shortsighted persons about the middle of the sixteenth century. Cylindrical spectacles first came into use in the nineteenth century. The first spectacles were hung from the cap; later the bridge of the nose was utilized as a support for the frame. The German word *brille*, for spectacles, comes from the Latin *beryllium*, which in the Middle Ages was equivalent to glass, and may be traced back to an Indian root. Professor Hirschberg points out that some painters of the sixteenth century who represent persons of early Christian times as wearing spectacles on their noses, were guilty of anachronism. He adds that the notion which prevailed so long that St. Jerome, who lived in the fourth century, was the discoverer of spectacles, is altogether unfounded."

W. R. P.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

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New Information Concerning the Photography of the Direct Inverted Fundus Picture.

WOLFF (*Die Ophthal. Klinik.*, 1906, No. 15). Some of the important features of the writers newly constructed photographic device include the use of the Zeiss projection apparatus and Köhler's lenses. The source of illumination is a 30 ampere arc light. The camera is 6 c. m. long, without bellows attachment and contains a plus 16 D. objective made up of two recess lenses of plus 13 D. and plus 3 D. For a complete technical description and sketch of the apparatus, the reader is referred to the original article.

Wolff, after dilating his pupil by euphthalmin photographed his own fundus. The scotoma following the instantaneous exposure lasted only a few minutes; there were no injurious sequelae.

Copies from the original photographs are appended. The pictures represent the fundus as viewed by the direct method. Though not exceptionally clear they adequately reproduce the natural color tone of the fundus.

A. C. S.

Multiple Fibromatous Polyps (Fibromes Muqueux) of the Tarsal Conjunctiva.

COSMETTATOS (*Die Ophthal. Klinik.*, 1906, No. 1). Cosmet-

tatos reports a case of multiple polypoid tumors of the tarsal conjunctiva in a child 7 years old. The polyps were pedunculated, about the size of a lentil, reddish in color, with smooth surfaces. Histological examination of the excised tumor masses verified the clinical diagnosis of fibroma, each excrescence being found to be composed of stroma and epithelium, the former consisting of delicate connective tissues fibrillæ, embryonal connective tissue cells and vessels. Leucocytes were present in small numbers. A layer of stratified epithelium enveloped the stroma. According to the author, fibromata of the conjunctiva are either of the soft or hard variety, their size generally varies from that of a lentil to that of a hazelnut, their usual situation is in the tarsal conjunctiva and the conjunctival folds. Their smooth surface and pedunculated attachment are characteristic. Clinically the differential diagnosis must be made from papilloma, adenoma and granuloma. *Papillomata* present a cauliflower or raspberry like appearance, *granulomata* follow injuries, *adenomata* are usually found near the caruncle.

Histological study shows that hard and soft fibromata are only manifestations of the different stages in connective tissue development. In the *granulomata*, of the tarsal conjunctiva the connective tissue is embryonal in type, vessels are plentiful, but the epithelial covering is lacking. *Papillomata* have a papillary arrangement, contain a vascularized connective tissue stroma and the epithelium resembles contaneous epithelium. *Adenomata* exhibit acinous glands and vessels in the connective tissue substance. (Angioma and sarcoma are omitted in this description.)

Excision followed by cauterization of the base to prevent recurrences, he considers to be the best treatment.

A. C. S.

The Argyll-Robertson Pupil; Its Definition and Localization.

BACH (*Die Ophthal. Klinik.*, 1906, No. 12), defines the Argyll-Robertson pupil as one which does not react to light either directly or indirectly or to nervous or psychical impulses; pupillary response to convergence being positive and prompt, the size of the pupil varying from $1\frac{1}{2}$ to $2\frac{1}{2}$ mm.

A double-sided amaurotic pupillary inaction may occasionally simulate double-sided Argyll-Robertson pupil. In the former, however, the pupils are usually large and moreover

react to nervous and psychical impressions. If the convergence pupillary reflex is present, it is elicited with more difficulty.

Much oftener is the Argyll-Robertson pupil confused with complete or incomplete absolute pupillary inaction (paresis and paralysis of the sphincter); in the latter condition the pupils measure at least $3\frac{1}{2}$ mm., while in the Argyll-Robertson pupillary state $2\frac{1}{2}$ mm. must be considered a maximal dilatation. Total absence of convergence reaction and sluggish pupillary contraction characterize respectively the complete and incomplete varieties. Though loss of the pupillary light reflex has been observed to merge into absolute pupillary inaction and vice versa, a sharp distinction between the two affections must be made. Such transformations do not prove that the lesions concerned in each affection are to be found in similar localities, on the contrary the author believes the various pupillary disturbances most probably traceable to differently placed lesions, alluding to Fürstner's observations, which showed that in tabes and general progressive paralysis of the insane, various parts of the nervous system could be affected independently of each other.

Localization—Bach is of the opinion that the Argyll-Robertson pupil is due to changes affecting certain fiber bundles running from the corpora quadrigemina to the medulla, or rarely follows stimulation of an inhibitory center in this region. The miosis he attributes to the functional exclusion of sensory spinal cord tracts and to the absence of psychical stimulation, hence to tracts which connect the cerebrum with the medulla.

The inhibitory center governing the pupillary light reflex and pupillary dilatation has been placed by Meyer and Bach in the distal portion of the medulla, their conclusions for the most part being derived from animal experimentation. They are, therefore, not entirely conclusive respecting the conditions as observed in man.

A. C. S.

Additional Remarks on the Photography of the Direct Inverted Fundus Picture.

WOLFF. (*Die Ophthalm. Klinik*, Sept. 20, '06, No. 18.)—The author submits two photographs (reproductions of his right emmetropic eye), made according to his methods as published in *Die Ophthalm. Klinik*, No. 15. They show that a large field without reflexes can be photographed. The camera length was 55 m. m., the recess oculars + 13 D \subset + 5 D

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being inserted. Focal differences of $\frac{1}{2}$ D. are overcome by moving the camera 1 m. m. to or from the eye. Wolff considers the temporary scotoma following exposure rather more pronounced than noted in his previous report, but still free from dangerous consequences. The photography of the fundus of others should be a much simpler process, as all necessary adjustments can be made beforehand.

A. C. S.

On the Prophylactic Treatment of Ophthalmia Neonatorum.

THIES (*Münch. med. Woch.*, Aug. 14, 1906). The author, to ascertain the prophylactic value of silver acetate in comparison with that of silver nitrate, made instillations of both in 2000 infants, employing a 2 per cent silver nitrate solution in the left eye, a 1 per cent solution of the silver acetate in the right eye. All installations were followed by normal salt irrigations. Five (0.25 per cent) cases contracted purulent conjunctivitis; in three both eyes, in two only the left eye were affected. There thus occurred 0.25 per cent of infections in the eyes treated by silver nitrate, 0.15 per cent of infections in the eyes subjected to silver acetate.

Cramer's silver catarrh occurred in both eyes in 45 cases, in 20 in one eye only; of the latter the left eye was affected 12 times, the right eye 8 times. Slight conjunctival irritation (duration 12 hours) was noted in the left eye in 9.3 per cent of the cases, in the right eye in 8.9 per cent; in 4.5 per cent both eyes were involved.

While solutions of silver nitrate on standing became more concentrated, solutions of silver acetate never attain a higher concentration than 1.2 per cent. Moreover liberated nitric acid is always more irritating than free acetic acid. Silver acetate is, therefore, not only slightly more efficient than silver nitrate, but a safer drug to place in the hands of a nurse or midwife.

A. C. S.

A Contribution to the Physiology and Pathology of Vertical Eye Movements.

STEINERT AND BIELSCHOWSKY (*Die Münch. med. Woch.*, Aug. 14, 1906). Steinert and Bielschowsky report a case of conjugate vertical palsy following a paralytic seizure. The associated lateral movements were normal. convergence was impaired, both spontaneous and latent diplopia were absent. At no time during the $4\frac{1}{2}$ months of observation was the con-

jugate paralysis complete. At first both the purely voluntary and reflex vertical movements (induced by visual, auditory, etc., impressions) could barely be elicited.

Passive elevation or lowering of the head, however, produced compensatory ocular movements in the opposite direction. On being told to fix a certain object, this visual fixation was preserved even after sudden rotation of the head up or down. Such compensatory movements, according to Breuer, are principally brought about by a disturbance of the endolymph in the semi-circular canals, which disturbance causes irritation of the terminal filaments of the vestibular nerve. Ocular equilibrium is thus restored.

In peripheral or nuclear derangements of ocular motility the limitations of movement are the same as demonstrated by other tests, showing that the condition is not one of ocular inertia. Roth is the only author who has given the subject of eye movements during passive head rotation much attention; he erroneously believes the condition to be the consequence of lightening the mechanical work assigned to the eye muscles.

They briefly refer to a case of encephalitis pontis in which reaction to head rotation was present while voluntary lateral movements were impossible. Several months later these special reflex movements were also lost, in other words, the hitherto intact labyrinthine reflex path succumbed to the disease process: the associated (supranuclear) palsy eventually terminating in a peripheral (nuclear-fascicular) paralysis. Autopsy revealed a tumor of the pons.

In the first mentioned case voluntary vertical fixation partly returned. From the primary position of rest (eyes slightly raised) the eyes could slowly follow an object up or down, but failed to respond when the object was suddenly elevated or lowered, suggesting a difference between this kind of motion and the previous described compensatory movement. At the end of passive rotation the eyes returned to the primary position; the eyes could only remain in upward or downward fixation by both reflex and voluntary innervation.

A. C. S.

A Contribution to the Physiology and Pathology of Vertical Eye Movements.

(Conclusion.)

STEINERT AND BIELSCHOWSKY (*Münch. med. Woch.*, Aug. 21, 1906). Three cortical centers controlling associated eye movements have been described:

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A—A center for searching or voluntary head and eye movements is localized by Tschermak and Roux in the frontal lobes at the foot of each second frontal convolution.

B—A center reacting to optical reflexes in the occipital lobes (calcarine fissure and adjoining areas.)

C—A center for auditory reflexes in the temporal lobes. Cases of loss of voluntary ocular motility with preservation of reflex motility have been described by Roux and Feilchenfeld (in a tabetic). Roux, Tschermak and others ascribe the disturbance to a functional deficiency of the frontal centers, Feilchenfeld to a derangement of the centripetal pathways causing a sensory ataxia. In the author's case the ability to look down or up on command or to fix an object situated above or below the horizontal level were equally impaired. The vertical movements attained approximately their normal range only by gradual displacement of the object of fixation above or below the eye level.

According to Bielschowsky this disturbance is the result of a lesion of the motor fibers conveying nervous impulses to the ocular muscle nuclei. The lesion is of such a nature that peripheral retinal impressions are no longer transmitted while paracentral impressions are still followed by muscular response. The faculty to visually follow a moving object results from a succession of slight innervations, starting at the central retinal region, each impulse contributing a correspondingly small fixation movement.

Localization of the lesion. As the oculo-motor system reacted no better to auditory than to visual impressions, injury to all cortical paths of the vertical motor region must be conceded. The symmetrical condition of defective ocular motility favors a single lesion. In the presence of undisturbed reaction to labyrinthine stimulation and impaired or abolished functions of other innervation paths, the lesion is most probably near the nuclei of the third nerve at the place where the outgoing cortical fibers are in close proximity to one another.

In conclusion they cite the histories of two cases in which, besides an elevator paralysis, there was paralysis of the individual muscles concerned. The cases demonstrate how the phenomenon of intact reflex motility during passive head rotation facilitates the diagnosis of conjugate paralysis. A C. S.

A New Theory of Color Perception Based on Anatomical-Physical Principles.

(Preliminary Remarks.)

RAEHLMANN (*Die Ophth. Klinik.*, No. 6, 1906). The recent discovery of so-called stationary ("Stehende") light waves after reflection from brilliant, smooth surfaces and the utilization of these facts by Lippmann in natural color photography suggested to Raehlmann an application of these principles to the phenomenon of color preceptions.

By Lippmann's method, after exposure of a silver bromide plate, the interference of the incident rays with the rays reflected from the mercury layer gives rise to stationary waves which come from the reflecting surface in half wave lengths. Thus, after vertical reflection of homogeneous light from a smooth surface, waves in opposite phases are destroyed, leaving only stationary waves whose length and position are peculiar to the particular kind of homogenous light, the nodal points of each color always holding the same relative position to the reflecting surface.

Microscopic examinations of plates exposed to monochromatic, polychromatic and white light showed conclusively the uniformity of these photochemical processes. With these principles in mind, the author attempts to explain the mechanism of color perception in the human eye. He contends that the difference in refractive indices between the outer and inner segments of the rods and cones, permitting the greater portion of light to be reflected back into the inner segments, results in the formation of stationary waves, each color wave possessing a typical arrangement, so that the maximal height of a certain homogeneous light wave always holds the same topographical relation to the inner segment, the waves being equi-distant from one another. The stationary waves owe their origin to the reflecting properties of the outer segment, which consist of numerous superposed disks. By the phototropic movement of the pigment, these outer portions become isolated reflecting surfaces. In the inner portions, isolated zones of stimulation are consequently developed, the location of these zones being different for homogeneous, mixed or white light.

The contraction of the inner segments during exposure to light is now universally conceded. According to Angelucci the amount of contraction is inversely proportional to the wave length. In conclusion, Raehlmann maintains that the

recognition of three or four primary colors renders the theory even more conceivable, the three primary color theory presupposing three gradations of protoplasmic contractility, the other theory, four degrees of contractility.

A. C. S.

The Etiology of Chronic Irido-Chorioiditis in Adults.

DISTLER (*Die Ophthalm. Klinik*, 1906, No. 13). Clinically chronic iritis includes a mild and a grave variety. The mild form is characterized by precipitation on the posterior corneal surface, and opacities of the anterior vitreous; often iritic complications are entirely wanting. The prognosis is in the long run favorable. In the grave form all parts of the uveal tract are involved; generally both eyes are affected and women between the ages of 40 and 50 years are especially susceptible. The disease occurred in about 0.3 to 0.5 per cent. of the author's cases. The course is extremely chronic. Though marked inflammatory symptoms seldom intervene, posterior synechiæ invariably are formed, often followed by pupillary occlusion and seclusion. Precipitation on Descemet's membrane, vitreous and lenticular opacities, chorioiditic changes, and rarely optic neuritis may complicate the process. The prognosis is unfavorable, while in a few cases, operative interference may ameliorate the condition, the great majority terminate in glaucoma, retinal detachment or atrophy of the eye-ball. Therapeutic measures are usually unavailing, mercury being perhaps the most useful drug.

Realizing that therapeutic success is largely dependent upon a clear conception of the causes of the morbid process in question, Distler reviews the literature of the past 10 years quoting views on the etiology of chronic iridochorioiditis as expressed by the following writers: Grandclement, Vignes, Batuaud, Dunn, Clavellier, Eversbusch, Schoen, Lefraucois, Brunson, Michel, Robine, Converse, Senn, Spirig, Woods, Maier, Friedenwald, de Schweinitz, Baum, Bachand, Elschmig and Reuchlin. He then arrives at the following conclusions:

1. That the causal factors responsible for acute uveitis may induce chronic uveitis.
2. That syphilis (at least in the authors district) is less often to blame than is generally believed.
3. That tuberculosis apparently plays an important part. (Reuchlin injected Koch's tuberculin for diagnostic purposes

in 30 cases of irido-cyclitis. In 27 the reaction was positive and in only 12 of these were there clinical signs of ocular tuberculosis.)

4. That auto-intoxications certainly are worthy of careful consideration.

A. C. S.

On Accidental Injuries with Special Reference to Ocular Disturbances Caused by Powerful Electric Currents.

JUNIUS (*Die Ophthalm. Klinik*, No. 11, 1906). The author in his introductory remarks discusses the effect of industrial electrical discharges upon the human organism. While voltage, direction, resistance, kind of current and individual predisposition in general determine the gravity of the resulting traumatism, too much importance should not be attributed to any single factor.. Each case deserves special consideration.

The nervous mechanism is particularly liable to injury. In America, post mortem study of those subjected to electrical execution revealed scattered hemorrhages in the brain, cord, heart and other organs.

The writer, in accord with views already formulated by Jessen, Jellinek, Wendriner and others concerning cases not terminating fatally, submits the following general statements:

1. Many individuals exposed to the most severe electrical traumatism, after recovery from shock and unconsciousness, exhibit absolutely no symptoms.

2. Grave symptoms, like those of traumatic neuroses or hysteria, may set in. No organic changes are discoverable.

3. Under certain conditions nervous derangements may ensue, namely multiple sclerosis, parietic dementia, tabo-paralysis and disturbances of the cerebral cortical function, conditions etiologically related to organic lesions (hemorrhages, direct injury to individual nerve cells).

On these principles he bases the comprehension of ocular affections the result of electrical traumatism. He refers to a case published by Braatz. The patient accidentally received a discharge of 500 volts. There were no immediate harmful results. Ten days later he suddenly became unconscious. This was followed by attacks resembling epileptic convulsive seizures. Six months after the accident sluggish pupillary reaction and slight nystagmus were noted. The patient then received a pension because of vertigo and convul-

sions. Four years later, in addition to the above-mentioned ocular symptoms, left-sided neuritic atrophy and chorio-retinitic patches were found. Vision 5/20, color blindness for red and green. Though the patient in childhood presumably was the subject of epileptic convulsions, Braatz considers the condition aggravated by the traumatism and the ocular changes he believed to be the direct consequence of such traumatism. The case teaches us not to overlook an eye examination in injuries of this kind. A first examination, especially from a medico-legal standpoint, may have a very important bearing upon subsequent ocular disturbances.

Other ocular sequelae are ptosis, pupillary changes, keratoconus, cataract, hemorrhages into the anterior chamber, vitreous, retina, choroid and optic nerve; also amaurosis following injury to the cortical visual center.

A. C. S.

On the Visual Disturbances Following the Observation of the Solar Eclipses.

FERENTINOS (*Die Ophthalm. Klinik*, 1906, No. 1). It was the author's privilege to make eye ground examinations in 5 cases with ocular symptoms, the result of observing with naked eye the solar eclipse on August 17, 1905.

The Indirect Method (with plus 3 D). In fresh cases a red patch the size of a lentil, enveloping a greyish area about pin-head size, was found in the macular region. The red area resembled the macular appearances in embolism and those occasionally observed in normal fundi of young individuals. The condition is attributed by Ferentinos to a thinning of the retinal layers in this region.

In the affection under consideration the outer sharply defined boundary of the red zone is brought about by irregular refraction of rays about the macular region, resulting in slight retinal clouding, thus sharply differentiating the enclosed red perifoveal region. The foveal opacity was more dense and totally obscured the chorioid. Starting peripherally, this grey spot gradually decreased in size, at the same time taking on a reddish tint, until apparently all abnormal conditions had disappeared. The direct method then had to be used.

The Direct Method. In the foveal region a grey area was discernible, encircled by a well defined red line, separating it from the less red macular region. The red line was only visible in cases of some duration. The central opacity represents

a charring of the retinal elements, the surrounding red zone, the consequence of peripheral retinal opacity and perifoveal reaction: *erythema solare retinae*. (Grave injury to the retina by ultra violet and ultra red rays is prevented by the ocular media.) The condition must be differentiated from central chorioiditis and, after the disappearance of macular changes, from chronic toxic retro-bulbar neuritis. In the former, however, the characteristic red line is wanting, the scotoma is negative and there is no visual fatigue. In the latter there are changes in the appearance of the disk; moreover, color perception suffers more than white perception.

Functional Disturbances:

A—Visual impairment (central scotoma).

B—Marked visual fatigue.

A—The central, positive scotoma results from changes in the anterior retinal layers, excluding light from the perceptive elements. The scotoma is of short duration. White and color perceptions suffer equally.

B—*Optic Hyperkopia*: This is a purely functional disturbance due to overwork of the visual conducting paths. Several weeks are generally necessary for complete restoration of function.

The prognosis is favorable; the fundus in time assumes a normal appearance; rarely do functional disturbances persist indefinitely.

Time is by far the best therapeutic agent.

A. C. S.

Secondary Glaucoma and Traumatic Cataract.

RAEHLMANN (*Die Ophthalm. Klinik*, 1906, No. 14). Normally the aqueous humor is almost free from albumen, the composition closely resembling that of physiological salt solution. The restoration of aqueous following a withdrawal of fluid from the anterior chamber is associated with a coincident secretion of albumen. In spite of this the aqueous appears transparent; only by means of the ultra-microscope is it possible to detect in the aqueous many minute albuminous particles. Under normal conditions these are evenly distributed, motile, isolated particles. The addition of ferments or precipitants, substances invariably accompanying inflammatory states of the anterior ocular segment (iritis serosa) results in agglutination and visible precipitation upon the posterior corneal surface. In this particular form of iritis Raehlmann also demon-

strated precipitation within the spaces of Fontana and along the walls of those spaces. On account of the numerous processes and spans of tissue, precipitation in this region takes place early and rapidly.

Sagittal section of an eye enucleated for iritis serosa showed these spaces invaded by indurated bands of tissue completely occluding the angle. The depth of the anterior chamber and the tension increase he therefore attributes to a passive congestion of intra-ocular fluids. In these cases, iridectomy affords only temporary relief.

The important part these albuminous particles play in the etiology of secondary glaucoma is particularly well illustrated in traumatic cataract. While the theory prevails that the swollen lens mechanically obstructs the outflow of aqueous, it is also true that the increase of tension is not always proportional to the amount of swelling. Experiments go to show that after discission many particles of globulin are liberated into the anterior chamber. Raehlmann believes the increase of tension to be due to a plugging up of the angle with precipitated particles of globulin. The more concentrated the fluid of the anterior chamber, the more readily are the globulins dissolved, dilution promoting precipitation.

The good results following normal salt injections of the anterior chamber of animals in which traumatic cataract had been produced, speak in favor of applying such methods to similar conditions in the human eye. The structural arrangement of the spaces of Fontana holds an important relation to the amount of precipitation in each particular instance. An individual predisposition to secondary glaucoma is thus recognized by the author.

A. C. S.

Results of the Inquiry Relating to Methods of Cataract Extraction.

Die Ophthalm. Klinik, 1906, No. 11. In response to a query emanating from La Clinique Ophtalmologique concerning the methods of cataract (senile) extraction in vogue at the present time, the following operators submitted to that journal their respective methods: deWecker, deLapersonne, Trousseau, Landolt, Galezowski, Abadie, Badal, Rollet, Lagrange, Mayweg, v. Michel, Pagenstecher, Czermak, Sattler, Dianoux, Vacher, Dor, Kuhnt, Truc, Schirmer, and Axenfeld. Hess, Fuchs, Snellen and Uhthoff were indirect contributors.

Die Ophthalmologische Klinik numbers 9 and 10 publishes

the salient points of each method, and in No. 11 is contained a summary of the two previous numbers. The following abstract is founded on this synopsis:

Preoperative Procedures. All consider a thorough ocular examination and a knowledge of the general condition of the patient essential to operative success. Many emphasize the necessity of aseptic demarcation of the operative region. Disinfection of the latter is begun by most operators the night before, by Sattler a few hours before, by deWecker, Fuchs, Schirmer and Uhthoff just before operating.

After preliminary disinfection many apply a bandage to maintain surgical cleanliness and incidentally to ascertain the condition of the conjunctiva. Opinions differ regarding the advisability of this procedure. Mayweg, Kuhnt, Axenfeld, Czermak and Haab cut the cilia short; only Czermak and Haab shave the eyebrow.

Systematic irrigation of the lacrimal ducts is recommended by some, partly for antiseptic reasons; partly to determine the patency of those channels. Kuhnt considers the character of the return flow of importance.

Adrenalin is used by Lagrange, Mayweg, Schirmer and occasionally by Vacher. Few instill a mydriatic. *Mouth shields* are worn by many of the operators. Mayweg, Czermak, Kuhnt, Truc, Haab, Schirmer, Uhthoff, Axenfeld and Abadie only resort to this precautionary measure when suffering with catarrhal trouble.

Most boil their instruments in soda solution. Galezowski, Pagenstecher, Schirmer, and Haab (in private practice) sterilize their instruments in antiseptic solutions without boiling. Abadie, Dor and Truc employ dry heat, a few boil their instruments in oil. Mild antiseptic solutions before and during the operation are advocated by the majority. Landolt, Hess, Snellen, Kuhnt, Schirmer and Truc instill normal salt solution, Fuchs and Haab authorize both methods.

The Operation. A special operating room is considered necessary by most of the authors. Electric illumination is used by deLapersonne, Czermak, Axenfeld, Lagrange and Snellen, the last two, however, only before applying the bandage. Haab always has an electric lamp in readiness.

The Incision. All favor large incisions. The sections are made through or parallel to, or near the limbus. Exceptions: DeWecker (both corneal punctures in the limbus, crest of

incision 1 mm. centrally from limbus); Galezowski (crest 2 mm. centrally from limbus); Lagrange (corneal punctures 1-2 mm. peripherally from limbus, crest passes through the limbus in simple extractions, somewhat more centrally in modified extractions). The Germans are partial to conjunctival flaps; of the French contributors only Truc and Landolt favor this method. To prevent infection and to insure wound closure Czermak performs subconjunctival extractions, Vacher makes a conjunctival bridge, Kuhnt a double pedicled conjunctival flap.

Iridectomy. DeLapersonne, Landolt, Galezowski, v. Michel, Hess, Dianoux, Schirmer perform iridectomy in all cases; Badal, Lagrange, Mayweg, Pagenstecher, Sattler, Truc, Haab, Unthoff and Fuchs in most cases; DeWecker, Rollet, Snellen, and Vacher in a few cases; Abadie, Czernak, Dor, Kunnt, and Axenfeld let the case decide the question. Trousseau is opposed to iridectomy.

Preliminary Iridectomy. The operation has few supporters. DeLapersonne, Mayweg, Kuhnt, and Truc sometimes do it; Sattler, however, only in conjunction with artificial ripening. Capsulotomy is done with cystitome, capsule forceps or point of cataract knife. Capsular irrigation is recommended by Vacher, Kuhnt and Lagrange.

The Removal of Fixation Forceps and Lid Speculum. DeLapersonne removes the forceps immediately after corneal incision, the speculum after capsulotomy. Landolt removes forceps before delivering lens, speculum after iridectomy; Galezowski both after capsulotomy; Badal after iridectomy; Lagrange removes forceps before, speculum after iridectomy; Dor, speculum after section.

Post Operative Treatment. Having completed the operation, Mayweg and Schirmer apply iodoform to the wound; Snellen bandages with cotton impregnated with bichlorid; Hess strokes the lid margins with bichlorid vaselin; Pagenstecher resorts to an ichthyol dressing. The "open wound treatment," as practiced by Hjorth, meets with no approval. The modified open treatment (perforated metal shields, etc.) is followed by Hess, Czermak and Sattler. The others immobilize the eye by a bandage and dressing. Metal shields, collodion, etc., are sometimes substituted for the former (DeWecker, Truc, Landolt, Snellen, Fuchs, Haab and Axenfeld.)

A. C. S.

On the Occurrence of Retinal Hemorrhages in Miliary Tuberculosis

MARX (*Muench. med. Woch.*, Aug. 28, 1905). In diagnosing between general miliary tuberculosis and septicemia, the occurrence of retinal hemorrhages in the absence of visible tubercles of the choroid is usually considered symptomatic of the latter affection. The case reported by Marx, however, demonstrates that too much reliance should not be placed on this symptom. Rare instances of retinal hemorrhages in general miliary tuberculosis have been described by Cohnheim, Stricker, Weigert, Litten and Ewer. In Marx's case no fundus changes were noted until the day before death, when circum-papillary hemorrhages were found in both eyes and in the left eye, on the temporal side of the disk, two small, yellowish white spots. The autopsy verified the probable diagnosis of disseminated miliary tuberculosis.

In the right eye, pathological examination disclosed a pre-retinal hemorrhage above and below the disk; another hemorrhage was also discovered near the disk but in the deeper retinal layers. In the periphery there was a circumscribed cellular infiltration without thickening of the choroid and without any disturbance of the pigment epithelium. Near the equator, three typical tubercles of the choroid were found. The choroid here was much thickened.

The left eye in general presented the same appearance, but near the disk two infiltrations consisting of round and epithelioid cells (undoubtedly the two spots seen antemortem) were found. The pigment epithelium over these tubercles had partially attached itself to the detached retina. A few very small tubercles were present in the periphery. No tubercle bacilli were detected in either eye. Marx believes the tubercles in the peripheral parts were obscured by the intact pigment epithelium or possibly sprung up just before death.

A. C. S.

Canthoplastic Operations with Use of Cutaneous Tissues.

KUHNT (*Zeitschrift f. Augenh.*, Vol. xv., p. 238). The author describes two operations for blepharospasm which give permanent results.

In severe blepharospasm, or narrow palpebral fissure, the outer canthus is cut with scissors to the bony orbital margin. In severe cases incisions are made 2 to 3 mm. in length into the fascia tarso-orbicularis, care being taken to separate all of

the fibers running from the temporal edge of the lids to the orbital angle. The skin and conjunctiva are deeply undermined in all directions, and a large Tiersch flap is placed underneath, covering all of the denuded areas.

When there is entropion or beginning inversion of the lids, the second operation is preferable. In this a rhomboidal flap is made 2 mm. outside of the outer canthus, with the stem 3 mm. by 6 or 8 mm. long extending directly outward. The eye is prepared as in the first operation, the flap being transplanted under the undermined conjunctiva instead of the Tiersch graft. The equilateral triangular defects above and below are closed with sutures.

F. K.

Blue Vision After Cataract Extraction.

ENSLIN (*Zeitschrift f. Augenheilk.*, Vol. xv., p. 136). The author thinks that blue vision immediately after cataract extraction is more common than red vision, and is more frequent than is generally supposed. It is usually observed immediately after the nucleus of the lens is extracted and lasts a variable length of time. It usually disappears in two weeks, and never is complained of after one month.

Enslin explains this phenomenon by the fact that the lens is never colorless, but even in youth is slightly tinted with yellow, and in the adult often assumes a very deep yellow or brownish tinge, and the lens cuts off the blue rays in a large degree. When the lens is completely removed, the light entering unchanged causes the blue rays to be most evident as they are no longer absorbed. Should much cortical tissue remain in the anterior chamber, blue vision does not result. It is most marked after operations upon nuclear cataract.

F. K.

The Influence of Chrysarobin Upon the Eye.

KRAUSE (*Zeitschrift f. Augenh.*, Vol. xv., p. 233). The author reports four cases of affection of the eyes due to the use of chrysarobin externally in psoriasis. It is usually supposed that conjunctivitis is primarily produced, the long continuance of which results in keratitis. The author's cases showed keratitis primarily, with slight conjunctivitis. He believes that the latter is usually mild, as conjunctival secretion is rarely noted except when chrysarobin has been accidentally introduced into the eye.

F. K.

Clinical and Experimental Studies of Subconjunctival Infections.

VERDERAME (*Zeitschrift f. Augenheilk.*, Vol. xv., p. 289). The author reviews the conflicting evidence of the therapeutic value of subconjunctival injections, and, in order to ascertain the effects of the various solutions used in this manner, performed a series of experiments upon the eyes of guinea pigs. He injected a different solution in each eye, and noted the results. He found, as has been observed in human eyes, that salt solutions were harmless, and caused only slight thickening of the conjunctive when 10 per cent solutions were used. This thickening disappeared in a few days after the injections ceased.

He observed no difference in the actions of cyanide of mercury and oxycyanide of mercury. They are very irritating and cause necrosis at the site of the injection and finally obliteration of the sub-conjunctival space. In repeated injections, there was contraction of the conjunctival cul-de-sac and entropion. The addition of 2 per cent salt solution to the mercury solutions modifies the caustic action of these salts; but if too frequently repeated, necrosis will follow, and should therefore only be used for a short time. The addition of acoin caused great increase in the reaction of the eye to the injections even of salt solutions and was followed by the formation of scar tissue in the conjunctiva. The author, therefore, believes that acoin is not a harmless anæsthetic when used for subconjunctival injections and should be used with caution.

F. K.

Contusion of the Eyeball with Subsequent Detachment of the Retina.

WEILL (*Zeitschrift f. Augenheilk.*, Vol. xv., p. 140). The author reports the case of an 18-year-old laborer who was struck on the left eye by a piece of iron several pounds in weight, which fell from the fourth story of a building. Several hours later, there was a decided swelling and ecchymosis of the lids and surrounding tissue, the skin being lacerated on the lids, cheek and root of the nose. The eyeball was but slightly reddened; there was some blood in the anterior chamber; the pupil dilated with atropin, and was drawn obliquely oval. There was a decided tremulousness of the iris, though further examination showed the lens in its place. There was no blood in the vitreous. In spite of the haze of the anterior chamber, the fundus was everywhere visible and showed no gross change.

The vision was $\frac{1}{3}$ normal and could not be increased by lenses. The lowered vision was supposed to be due to the haze in the anterior chamber and to the mydriasis.

After 10 days of ambulatory treatment, the wounds were healed. The vision was $\frac{1}{2}$ of normal and could not be improved. The pupil remained larger than its fellow and reacted sluggishly to light. The cause of the lowered vision could not be ascertained. The patient was allowed to work, though supervision was advised. Three weeks later no further change was noted. Three or four weeks later and two months after the original accident, the patient returned with the statement that his vision in the left eye was diminished. The central vision was $\frac{1}{3}$ normal. There was a peripheral detachment of the retina above and in, with fine floating opacities in the vitreous. Under treatment the condition improved, but later the patient became neglectful and the detachment became extensive with diffuse vitreous opacities.

The author believes that in view of the possibility of retinal detachment ensuing after contusions of the globe, rest in bed should be enforced early in every suspicious case, though no lesion is demonstrable. F. K.

Keratitis Parenchymatosa and Traumatism.

ENSLIN (*Zeitschrift f. Augenh.*, Vol. xv., p. 227). The author is convinced that parenchymatous keratitis may be caused by traumatism and that the casuistic importance of this subject should no longer be neglected. He reports the case of an 18-year-old paper hanger's helper who stated that a piece of what he supposed was plaster fell in the right eye as he was pulling paper from an old wall. He washed it out immediately but the eye continued to pain and was sensitive to light. The left eye was injured by a splinter of wood before the patient's tenth year, and in spite of treatment became gradually blind. It presented leucoma adherens, cataract and probably detached retina, no red reflex being obtainable. The right eye presented tarsal and ciliary congestion, lacrimation and photophobia. Below and out on the cornea was a narrow dense band-like opacity evidently involving the deeper layers of the parenchyma. The epithelial covering was stripped but continuous, as tested with fluorescein. The rest of the cornea and media were clear, the chorioid showing no lesions. The vision was $\frac{5}{6}$. Refraction emmetropic.

The patient was treated with rest, atropin and hot boric stupes, in spite of which the opacity spread toward the center of the cornea. The epithelial covering continued intact, the opacity involving the deeper layers. Finally, the whole cornea became opaque, the few grayish spots and stripes, which were first apparent, having disappeared. After having reached its height, the opacity began to clear in the periphery and the center presented somewhat the appearance of keratitis disciformis. The vision increased from hand movements at one meter to 5/10. There was no constitutional cause in the history of the patient that could explain this inflammation. The cornea at no time presented any vascular formation, which the author considers of no particular significance as he has noted a vascular keratitis parenchymatosa of the right eye follow a vascular inflammation of the left eye after six months' interval.

The author believes that the keratitis parenchymatosa was due to the injury affecting an eye that was predisposed to inflammation, but which would not have been affected had it not met with traumatism. Therefore, the accident insurance companies were liable for the inflammation. F. K.

A Striking Congenital Anomaly of the Eyes (Cordlike Connection Between Cornea and Pigment Layer of the Iris.

HERBST (*Klin. Monatsbl. f. Augenheilk.*, June, 1906) describes a case in a 9-year-old, healthy girl, in which a pigmented cord ran from the posterior surface of the cornea, across the anterior chamber to be attached to the pigment layer on the posterior surface of the iris. The surrounding cornea showed a brownish pigmentation, but the remainder of the cornea was normal. In other portions of the pupil there were small ($\frac{1}{2}$ to 1 mm. long) black excrescences extending from the pigment layer into the pupillary area. In the fellow eye similar excrescences were found and a cord which passed through the pupil and waved freely in the anterior chamber. A pigmented area on the posterior surface of the cornea, however, probably indicated a point at which the cord had previously been attached to the cornea. These cords differed from previously described anomalies in coming from the posterior surface of the iris, instead of from the anterior surface. They, therefore, could not be considered as attachments of the pupillary membrane to the cornea, but rather as an adhesion between the outer layer of the secondary optic vesicle and the

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mesodermic layer which constitutes the cornea, at a time when the layers are in close contact, before the formation of the anterior chamber. The pigmented excrescences from the pigment layer of the iris and the pupil are quite common in lower animals, especially the horse, and similar cases have been reported in man, but no case is on record of an attachment by an extension to the cornea.

E. A. S.

LINDENMEYER (*Klin. Monatsbl. f. Augenheilk*, June, 1906) reports a case in which a burn of the lower two-thirds of the arms and the backs of the hands, in a perfectly healthy man, 19 years of age, was followed two weeks later by pain in the eyes and reduction of sight. Seven weeks after the accident examination showed slight optic neuritis, with well marked pallor of the temporal halves of the nerves, and a few retinal hemorrhages in the neighborhood of the disc. Vision was reduced to finger counting at 1 m., the peripheral fields were normal, but there was an absolute central scotoma for white and colors. Subsequent treatment with sweats, subconjunctival salt injections, and potassium iodide internally improved the vision on one side to 1/15, on the other to 1/35. Similar cases of optic neuritis and retinal hemorrhages have been described by Mooren, Knies and Wagenmann following skin burns, the symptoms in some cases appearing within a few days, and in other cases not until several weeks have elapsed. In most cases the progress has been better than in the present instance. Lindenmeyer discusses the various theories which have been adduced to account for severe general symptoms after skin burns, viz., changes in the blood, auto-intoxication and intoxication by some poisonous material produced by the burn itself, and inclines to the last named. This would agree best with the fact that the optic nerve affection did not appear until two weeks had elapsed, and moreover the clinical picture of retrobulbar neuritis corresponds most closely to the type usually observed in intoxications.

E. A. S.

Is the Foetal Cornea Vascularized?

HIRSCH (*Klin. Monatsbl. f. Augenheilk*, July-Aug., 1906) prefaces the main subject of his paper by an historical account of the discussion over the presence of vasa serosa and true blood vessels in the adult cornea, and shows that the earlier

claims of Hyrte F. Arnold, Jul. Arnold and others as to the presence of fine vessels reaching to the center of the cornea, in normal eyes have been shown to be erroneous and that since the investigations of Leber in 1865, which were published in the reports of the Vienna Academy, all writers have followed his dictum that neither the cornea nor its conjunctival covering, in a normal condition, possess any bloodvessels except those at the margin which extend inward not more than 1 to 2 mm. These results of Leber were obtained after numerous injection experiments, and all other contradictory results were declared to be the result of the use of pathological material.

On the other hand Hirsch shows that nearly all textbooks on the subject accept the teaching that the foetal cornea, both in man and in the lower animals, possesses a well-developed capillary bloodvessel system, which gradually disappears before the end of foetal life, but which may remain after birth occasionally in the lower animals. He shows from an examination of the literature that no injection experiments have been performed on the human foetus, and further mentions a communication of Schöbl in 1866, in which as the result of a long series of injections, Schöbl denied the existence of the foetal capillary system. In a foot note, also, he quotes Hippel's conclusion in the second edition of the Graefe-Saemisch Handbuch, that "since Leber and Schöbl's investigations, we know that the cornea, with the exception of the superficial and deep marginal network, at no time of its development contains any bloodvessels."

This conclusion Hirsch has corroborated by a series of investigations, in which he injected pig and human embryos. He found that the vascular supply of the cornea arises from the arterial branches which supply the four recti-muscles and the superior oblique muscle. These branches unite to form an irregular vascular ring which runs parallel to the cornea, and sends innumerable branches inward which form a capillary network, which never reaches further than about 1 mm. within the corneal limbus, at any period of foetal life. He, therefore, believes that the view that the marginal network in the adult is a remnant of a complete foetal network must be given up, and the teaching that the foetal cornea is vascularized should disappear from the text books.

E. A. S.

A Simplified Operation for Corneal Staphyloma.

WICHERKIEWICZ (*Klin. Monatsbl. f. Augenheilk.*, July-Aug., 1906).—In staphyloma of the cornea, in little children, when the tissue is quite thin, and there are no cicatricial adhesions between the posterior wall of the staphyloma and the lens capsule, Wicherkiewicz proposes a simple operation, which he has performed successfully in one case. The child was six months old, and the condition was the result of blenorrhoea neonatorum. The entire cornea was involved, with the exception of a small, clear area above. Tension was increased and an iridectomy was first performed opposite the clear part of the cornea above. Subsequently the staphyloma was found to be protruding further and under cocaine the following operation was performed: The thin wall of the staphyloma was perforated with a Bowman's needle, and the aqueous evacuated. The staphyloma collapsed and became wrinkled. It was then seized with a pair of forceps and an oval piece was excised with scissors which measured about 4 to 6 mm. in height, and of the width of the cornea. The wound edges fitted accurately and no sutures were necessary, the eye being closed by a pressure bandage. The healing was prompt and the child was sent home several days afterward. The scar was scarcely visible and the eyeball remained of the same size as its fellow, the cornea having the normal curvature while the clear part above had widened. The operation could not be recommended when the staphyloma had thick walls. To determine the question of adhesions he advises the use of a transilluminating lamp (Sachs').

Contribution to the Injuries of the Eye by Artificial Anilin Dyes.

MELLINGHOFF, R. (*Klin. Monatsbl. f. Augenheilk.*, July-Aug., 1906).—Injuries to the eye with the production of conjunctivitis and keratitis, sometimes with destruction of the eye through perforating ulcers of the cornea, as the result of the introduction of one of the anilin dyes into the conjunctival sac, have become more frequent, especially in Germany, with the rapid growth of the artificial dye industry. As Vogt and others have shown, the more basic the dyes (the greater the number of the methyl groups (CH_3) in their chemical constitution), and the greater their solubility, the more dangerous they are to the eye. Mellinghoff gives the detailed history of a case of kerato-iritis, which required treatment for three

months because of the recurring loss of the surface epithelium, and fresh attacks of keratitis. The cornea remained permanently clouded and its sensibility was reduced; vision was ultimately increased to 6/18. The author recommends Vogt's suggestion that in such injuries the material should not be washed out with water, but that a 5 to 10 per cent solution of tannin should always be on hand, in the factories, or where anilin pencils are used for copying purposes. If this is not present, water should be avoided, as the sodium chlorid in the tears keeps the dye stuff partly insoluble. The factory hands should be protected by spectacles. Mellinghoff suggests to the chemists the search for a less poisonous dye stuff than methyl violet, although it may be difficult to replace it on account of its low melting point.

E. A. S.

Concerning Cysts of the Iris, Especially Their Treatment.

FRUCHTE (*Klin. Monatsbl. f. Augenheilk.*, July-Aug., 1906) describes two serous cysts, and one pearl cyst of the iris, which were operated upon by Prof. Axenfeld in Freiburg. Both of the serous cysts were successfully treated by free opening of the cyst wall by means of a Graefe knife (in one case two operations being necessary). The pearl cyst was removed, together with a piece of the iris, after a large incision in the limbus. The cornea was held forward by means of a sharp hook, so that the cyst could be fully exposed, and readily removed. Früchte discusses the literature of the subject, especially in the matter of treatment, and says that Prof. Axenfeld believes the greater number of serous cysts can be removed by simple transfixion of the wall which may have to be repeated, and this method is to be preferred to the more radical operations. On the other hand pearl cysts require total extirpation, with a portion of the iris, the sphincter being preserved.

E. A. S.

Septic Retinal Changes in Typhus Abdominalis.

PAUL, L. (*Klin. Monatsbl. f. Augenheilk.*, July-Aug., 1906). —The occurrence of the so-called Roth's spots, yellowish-white spots in the retina in pyemia, septicemia and other septic processes is not infrequent. They may be divided into two categories: (1) those which show anatomically a round cell infiltration in the retina and are similar to the septic infiltrates in other parts of the body, and (2) those in which only a local edema of the nerve fibre layer with varicose hypertro-

phy of the fibres and here and there small hemorrhages. The cause of the second type is much disputed; micro-organisms have never been demonstrated in the lesions, and they have been described in connection with diseases, such as scurvy, which do not belong directly to the pyemic diseases. Paul had the opportunity to study such a case which occurred during the course of typhoid fever in a patient in the Breslau University Hospital in Prof. Strümpell's service. Ophthalmoscopic examination showed just before death, small, white, round foci, about $\frac{1}{2}$ disc diameter, near the large vessels in the neighborhood of the nerve entrance. They surrounded the nerve like a wreath, the macular region being free. There were also numerous fresh hemorrhages of varying size near the papilla. The vessels showed no changes; iris and chorioid were normal. Both eyes were affected. Repeated examinations had shown no other organism in the blood or elsewhere than the typhoid bacillus. Postmortem examination confirmed the clinical diagnosis and showed no signs of a septic infection. The microscopical examination of the retinal foci revealed small localized areas of edema of the nerve fibre layer with varicose hypertrophy of the individual fibres, and atrophy of the nuclear layers with displacement of the cellular elements. The hemorrhages arose from the larger veins. In the vessels no changes were discovered, neither thrombosis nor disturbance of the endothelium. Careful examination failed to discover any microorganisms.

Such lesions have not been reported hitherto in typhoid fever. Paul believes that they are not of direct bacterial origin, on account of the absence of local inflammatory reaction, but are probably due to toxic products circulating in the blood. He thinks, moreover, that the toxic substance is not the specific bacterial toxine, but perhaps a substance produced by the action of the bacterial toxine in the organism. The hemorrhages are a more frequent find, and are due to the action of the toxic substance upon the endothelium of the vessels, changes which are not demonstrable by the microscope.

E. A. S.

Concerning Painless Subcutaneous Injections of Mercury.

HIRSCH (*Medizin. Klinik*, 1906, No. 9, Ref. in *Woch. f. Ther. u. Hyg. des Auges*, June 28, 1906).—Hirsch uses a preparation of 1 per cent aqueous solution of oxycyanide of

mercury with 0.5 per cent acoin, made by a special method by the Heyden chemical works. He has treated 20 cases of congenital and acquired syphilis. Pain was practically absent in all the cases, and the site of injections remained free from reaction. Hirsch injected at intervals of 2 to 4 days 1 to 1½ ccm. in adults and correspondingly smaller doses in children. The injections were made subcutaneously on both sides of the spinal column. According to Hirsch the injections work more rapidly and permanently than inunctions. In iritis synechiæ are prevented, and the extension of inflammation in parenchymatous keratitis is checked. The soluble salts of mercury are also very rapidly excreted: 8 days after the last injection, the urine shows no trace of the mercury. E. A. S.

Concerning the Möbius Symptom in Basedow's Disease.

Möbius in the second edition of his monograph on Basedow's disease (Ref. in *Woch. f. Ther. u. Hyg. des. Auges*, July 19, 1906) says, concerning the symptom of insufficiency of convergence, which was first described by him in this disease: All other movements of the eyeballs are free; if, however, the patient is asked to look at a near object (e. g. the point of his nose, or a finger held in front of his eyes) the eyes diverge, and only one eye fixes the object. The symptom is best developed when the eyes look first at a distant object and then at the nose. The patients are not conscious of the divergence, and have no double images; they complain only of a feeling of tension, as long as the eyes converge. The convergence insufficiency is not in direct proportion to the exophthalmus, for it may be marked when the latter is slight and vice versa. It occurs also in other diseases: it is seen in low degree in various conditions of weakness. Möbius has noted it in high degree in progressive bulbar paralysis. It probably indicates a special weakness of the eye muscles, their most exhausting movement being that of convergence upon near objects. It does not go parallel with the general bodily weakness in Basedow's disease, as it may be marked in otherwise vigorous individuals and may be absent in feeble ones. According to Möbius it is present in the majority of cases.

E. A. S.

Historical Observations Upon Artificial Eyes.

HIRSCHBERG, J., (*Centralbl. f. prakt. Augenheilk*, Dec., 1905) considers Paré to have been the first to recommend the

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insertion of artificial eyes in the living. Many Egyptian mummies contain artificial eyes in the mask, while the Greeks and Romans put artificial eyes in their statues. He quotes a passage from the Talmud, which he shows is incorrectly interpreted to mean the use of an artificial eye. C. L.

Artificial Eyes from Old Mexico and Other Nations.

PERGENS, E., (*Centralbl. f. prakt. Augenheilk.*, Dec., 1905) describes some artificial eyes which he found in the British museum in London. They had been found in Egypt, Old Mexico, New Zealand, Darnley Island, South America, etc.

C. L.

The Treatment of Embolism of the Retinal Artery.

SCHAPRINGER, A., (*Centralbl. f. prakt. Augenheilk.*, Dec., 1906) believes that when an embolus of the retinal artery follows a coughing spell, the possibility of an air embolism must be taken into consideration. Where this is diagnosed the treatment is to put the patient at once into a pneumatic chamber and allow him for a long time to breathe compressed air. Of course, this increase in the air pressure must be made gradually, and in the subsequent rarefaction to normal, the greatest possible care must be taken. In other words, the case is treated as one of caisson-disease. If a pneumatic chamber is not at hand, inhalations of oxygen can be tried.

C. L.

Local Amyloid Changes of the Eyelids, Experimentally Produced.

ADAMUCK, VALENTIN, (*Centralbl. f. prakt. Augenheilk.*, Dec., 1906) makes a preliminary report of the results of attempts to produce amyloid changes in the conjunctiva of rabbits, by means of subconjunctival injections of cultures of staphylococci. Three of the several rabbits experimented on gave positive results, in that portions of the conjunctiva, when removed and examined microscopically, showed a new homogeneous substance which give the amyloid reaction with different anilin stains, though the iodine-sulphuric acid test gave a negative result. The localization of this amyloid substance in the section was as follows: (1) The central part of the specimen was occupied by a number of pus cells, with the polynuclear predominating. (2) Around this was a layer of polyblast (Aximoff's plasma cells). (3) Between these cells lay the amyloid masses. (4) A layer of polyblast, mixed at the periphery with fibroblasts. (5) New-formed, young con-

nective tissue. (6) The tissue peculiar to the lids. In this, a large space of hyalin degeneration of the connective tissue. The fibres were thickened, swollen, fused together, and in many places ruptured.

The above is only a preliminary report, and should be judged accordingly. C. L.

Congenital Connective Tissue Formations in the Vitreous.

J. HIRSCHBERG AND O. FEHR (*Centralblatt f. prakt. Augenheilk.*, January, 1907) report the case of a 12-year-old girl whose right eye squinted outward since birth. Ophthalmoscopic examination revealed a light blue, bladder-like body resting on the retina and sending a projection upwards and inwards to the optic disk, whose temporal half it covered. Another projection continued upward and was inserted into the retina. Blood vessels could be seen in this body. A third projection was continued into a vitreal cord of fine fibers which ran to the upper outer periphery and became a thick white cord which passed over into a broad, white, triangular tissue.

C. L.

**A Rare Case of Glaucoma Simplex of Twenty Years' Duration
Examined Anatomically.**

J. HIRSCHBERG AND S. GINSBERG (*Centralblatt f. prakt. Augenheilk.*, January, 1907) report a case of glaucoma simplex which had been under the supervision of the former for twenty years. A resumé of the clinical history is given, including the treatment with instillations of physostigmin. Finally acute glaucoma supervened, and it was necessary to enucleate the eye.

The microscopical examination showed, in brief, a circular obliteration of the iris angle, atrophy of the chorioid, hypertrophy of the suprachorioidea, excavation and simple atrophy of the optic nerve. There were a few hemorrhages, but very slight arteriosclerotic changes.

C. L.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

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PROVIDENCE, R. I.

Second Extraction of a Subretinal Cysticercus and Methods Employed to Determine Its Location.

SCIMENI, PROF. E. (*Annali di ottalmologia Fasc.*, March 3-4, 1905).—This is the sixth case in all the literature of the subject of intra-ocular extraction of a cysticercus with preservation of sight, the first one belonging also to the author (1898). According to the same the disease is not as rare as it appears, it is liable to be mistaken in its advanced stages with other detachments of the retina, and extraction is always advisable when a diagnosis is possible, for the eye under the influence of the chemical products of the parasite, left to itself, sooner or later undergoes disorganization. By placing the patient in the center of the perimetric arc the observer with the ophthalmoscope moves his head on the arc until he finds the exact situation of the parasite. The position of the arc gives the meridian and the degree from the fovea. Knowing the diameter of the papilla to be mm. 1.4 we can, by a simple method, measure with the inverted image how many pupillary diameters and millimeters the cysticercus is distant from the posterior pole. With some simplified mathematical formulae the author thinks to have solved the question of the exact situation and the dimension of the parasite.

Chronic Affections of the Lacrimal Apparatus Studied by Means of the Extirpation of the Lacrimal Duct.

BASSO, DR. DOMENICO, Genova (*Annali D' Ottalmologia Fisc.*, Marc'h 4, 1905).—The author has had much experience in the operation of extirpation in toto of the lacrimal duct (lacrimal sac and nasal canal), and by keeping the different specimens he has had the opportunity to study the pathology of the chronic lacrimal affections. While the attention of the other investigators has been directed more toward the study of the pathological histology of the lacrimal apparatus, Basso

thinks that the study of the macroscopical alterations is most important. He makes the following clinical classification:

1—Epiphora. In this class the patient is annoyed by lachrymation, and the macroscopical appearance reveals nothing abnormal, although an incipient alteration of the mucous membrane is observed with the microscope.

2—Simple chronic dacryocystitis with secretion, which by compression comes out through the lacrimal puncta. Here there is alteration of the mucous membrane, but no obstruction of the nasal canal and canaliculi.

3—Chronic dacryocystitis with reducible lacrimal sac tumor on pressure. The sac is always enlarged, the nasal canal is more or less obstructed, the obstruction, according to the author, beginning on the nasal end. The canaliculi are not altered.

4—Chronic dacryocystitis with irreducible lacrimal tumor (mucocoele, empyema of the sac). The nasal canal and the opening of the canaliculi in the sac are occluded, the sac is distended. Mucocoele, according to the author, is a chronic distention of the sac with hyperplasia of the epithelium and atrophy of the sub-mucous membrane; while empyema is a regular inflammation, with destruction of the epithelial layer, and the formation of granulations on the surface of mucosa.

In regard to the treatment the author says that no benefit can accrue to the lacrimal apparatus with the old method of probing in those cases of epiphora in which no evident alterations are observed. He believes that injections alone are rational. In chronic dacryocystitis with secretion without dilatation repeated probing, he says, is apt to do harm to the mucous membrane. Consequently he finds more rational the permanent Cirincione's style, but he cannot see any benefit from Tartuferi's curettage. In chronic dacryocystitis with enlargement of the sac, a disease which implies more or less cicatricial occlusion of the nasal canal and canaliculi, the gradual dilatation with probes cannot produce any benefit at all. In such cases he performs the extraction of the sac and nasal canal. The same operation he advises when the eye must be operated (cataract extraction) in ulcers of the cornea, and hypopion keratitis.

R.

Researches on Dacryoadenitis.

ORLANDINI, DR. ORLANDO (*Annali d' Ottalmologia Fasc*, March 4, 1905).—Although the affection is considered rare,

the author has observed many cases of inflammation of the lacrimal gland. The histological examination has revealed that the inflammation is not different from that of other organs. The palpebral portion of the gland is the most frequently affected according to his observations. The pathological process is either propagated from the blood vessels or from the conjunctiva, through the excretory ducts to the parenchyma of the gland. The bacteriological examination in most cases has resulted negatively. This is probably due to the fact that the tears in the conjunctiva constitute a very sterile field to the development of pathogenic germs, as has been proved already by other investigators.

The same may be true of the parenchyma of the gland.

R.

Pathological Alterations in Suppuration of the Choroid with Very Slow Course.

STEFANO, DR. SANTUCCI (*Annali D' Ottalmologia Fasc.*, May 6, 1905).—A patient 28 years old entered Prof. Raymond's clinic in Turin with the following symptoms: Exophthalmos, enormous enlargement of the globe, ulcer of the cornea infiltration, edema of the lids, thick conjunctiva, and loss of the sight. The history of the case revealed that eight years previously he was hit by a stone on his left eye, a traumatic ulcer probably being the result. The sight in this eye remained very weak after the accident, but otherwise the organ has appeared always normal to his parents. A week before his admission in the clinic it began to enlarge until it assumed enormous dimensions. The enucleation revealed a complete disorganization of the cornea, iris, ciliary body, choroid, the lens comparatively intact and an infiltration of the conjunctiva and orbital tissues. The author thinks that an ulceration of the old leucoma opened the entrance to pathogenic germs into the eye through the iris, ciliary body, choroid, and through the conjunctiva into the orbital tissues. The slow course of the inflammation, according to the author, is explained by the great resistance of the ocular tissues, the patient being physically vigorous.

R.

Paraffin Injection in the Treatment of Entropion.

MORETTI, Dr. Ezio (preliminary note) (*Annali D' Ottalmologia Fasc.*, May 6, 1906).—The satisfactory results obtained by experiments made on animals encourage the author to hope for the future treatment of some lid

affections, especially entropion. He holds the lids with a Desmarre's forceps and with a Pravaz syringe injects between the tarsal cartilage and the skin paraffin previously sterilized at the temperature of 60 degrees C. The tissues become red and swollen at first, then the symptoms of irritation gradually subside and the lids assume an everted position. The benefit of this operation consists in this, that on the external surface of the cartilage an inflammation arises, which is followed by a regular contraction in an opposite direction of that which has already taken place on the internal surface (cicatricial contraction due to trachoma). The author has come to this conclusion by carefully examining under the microscope the lids thus injected and observing the alterations of the tissues and the ultimate phases assumed by the paraffin.

R.

Echinococcus of the Orbit.

BARDELLI, DR., (*Annali D' Ottalmologia Fasc.*, May 6, 1906).—Exophthalmos, deviation upward of the eye, pain, papillitis, swelling of the conjunctiva in correspondence of the inner and lower margin of the orbit were the symptoms in a case reported by Dr. Bardelli, symptoms which are ordinarily found in all the tumors of the orbit. The diagnosis of echinococcus cyst of the orbit being very difficult, especially when we consider that fluctuation is rarely present, the author has had recourse to the blood count, and he thinks the increase of eosinophilic cells in the blood is a pathogenic symptom of the affection.

R.

Tuberculosis of the Sclera—Clinical and Anatomical Observations.

CALDERARO, PROF., (*Clinica Oculistica. Anno VII*, June 1906).—The sclera being of a fibrous structure and with few blood vessels it is very resistant to endogenous and external tubercular infections. Consequently primary scleral tuberculosis is a rare affection, few cases having been recorded, to which number the author adds now three more, the subject of this article. A primary episcleral infection, according to Valude, cannot take place if the cornea and conjunctiva are intact, the tears neutralizing the virulence of bacilli, which often are found in the conjunctival sac. Slight abrasions produced especially by foreign bodies on the tarsal conjunctiva are, according to Fuchs, the origin of episcleral tuberculosis. The author distinguishes three periods in the scleral tubercle.

176. ABSTRACTS, ITALIAN OPHTHALMIC LITERATURE.

1—Episcleral period. In the supero-lateral quadrant a round nodule appears implanted on the sclera a few millimeters from the cornea, covered by the conjunctiva, slightly injected and movable.

2—Ulcerative period. The bulbar conjunctiva covering the tumor becomes distended, thinned and finally ulcerated, and through this loss of substance a fungus growth appears. The sclera becomes infiltrated and the neoplasm comes in contact with the uveal tract which opposes great resistance to the infection.

3—Regressive period. The tumor gradually diminishes and the ulcer heals. Episcleral tuberculosis, according to the author's observations, assumes the form of solitary tubercle and the spontaneous restitutio ad integrum of the organ is the ordinary result. R.

Rational Treatment of Blepharitic Conjunctivitis.

DE FALCO, DR., (Major Surgeon of the Army) (*La Clinica Oculistica*, July-August, 1906). Dr. De Falco thinks that the ordinary treatment of strong sol. of nitrate of silver, recommended by all the authors in blepharitic conjunctivitis, is as harmful as unscientific. The caustic action of this salt by destroying the continuity of the epithelium favors the entrance of the gonococcus in the parenchyma of the cornea and the destruction of this membrane. According to Legrain in a first period, which lasts only a few hours, the germs are on the surface in the epithelial layer and are very active, while in a second period of longer duration they penetrate in the stroma of the mucous membrane, where they remain in a state of relative inactivity. The gonococcus is consequently aerobic, its virulence being most active on the surface of the mucous membrane in contact with the air. Clinical facts have proved this assertion. In fact if metastatic blepharitic abscesses are treated with the precaution of not introducing air in the affected tissues improvement takes place in short time and no bad results are observed. The attenuated virulence of this germ in the tissues is further confirmed by the metastatic blepharitic irido cyclitis which have ordinarily a benignant course, assuming the form of serous iritis, rarely of purulent, and are easily amenable to treatment. Therefore the best way to fight, according to De Falco, a blepharitic infection, is to reach the gonococcus in the tissues through the blood, or

the lymphatic circulation. The anareobic life having rendered its vitality very low a weak antiseptic can destroy it. In 1892 a certain author wrote an article condemning irrigation of the conjunctiva with nitrate of silver, following the researches of Legrain advising in its stead repeated irrigation with a sol. of salicylic acid, instillation of weak sol. of nitrate of silver (1-600). De Falco applied the new treatment in several cases and attributing the brilliant results solely to luck, he discontinued it, and returned to the old method. After many years of failure in the military hospitals, he returned to his past studies and adopted, besides the subconjunctival injection of sublimate, which are in accord with the important Legrain's researches. As an eye wash every few minutes the author uses a solution of salicylic acid (3.1000), besides permanent cold or iced compresses with the same sol., a low temperature arresting the proliferation of the gonococci, as has been proved. The instillation of a weak sol. of nitrate of silver (1.600) every three hours, which has an elective action on the gonococci, is very useful and does not alter the lining epithelium. When a great chemosis of the conjunctiva takes place, a sign of great virulence of the affection, the pathogenic germs cannot be easily removed from its folds by the above solution and the eye is threatened with destruction, then the sub conjunctival injections of sublimate (1-2000) render great service. The sublimate thus introduced extracts through its deoxidizing property oxygen from the leucocytes and gonococci, arresting the ameboid movements of the former and reducing the activity of the latter, which lastly are killed by the antiseptic action of the sublimate. R.

Traumatic Enophthalmos Associated with Voluntary Exophthalmos.

PASETTI, DR. GIUSEPPE (*Annali D' Ottalmologia Fasc.*, May 6, 1906). Dr. Pasetti has searched through the medical literature of the subject and has found only 14 cases recorded previous to his own one. Enophthalmos is either spontaneous or traumatic and the explanations given by the different authors in regard to its development are the following:

- 1—Fracture of the walls of the orbit.
- 2—Rupture of the pulley of the great oblique.
- 3—Atrophy of the retrobulbar cellular tissue.
- 4—Contraction of the same, following hemorrhage in the orbit.

5—Disturbance of innervation of the sympathetic (tropho-neurosis).

6—Rupture of the expansions of Tenon's capsule to the orbit in correspondence of the insertions of the recti on the globe.

In the author's case, a boy of 12 years of age, who had sustained at the age of 2 a wound of the eye-brow, there was enophthalmos and considerable protrusion of the eye in bending forward, or when the jugular vein was compressed. While this temporary exophthalmos was taking place a drooping of the upper lid was observed constituting a regular ptosis. Vision was normal in the upright position and began to diminish in that position favoring exophthalmos until the eye became totally blind. Vision then returned to the normal as the protrusion disappeared. We have consequently here a permanent enophthalmos associated with transitory exophthalmos (called also voluntary exophthalmos) and ptosis. The author excludes fracture of the orbit, the wound having interested only the soft tissues, and affection of the oblique muscles, the movements of OD being normal in all directions. Dr. Pasetti thinks that in his case with atrophy of retro-orbital cellular tissue there is disturbance of the capsule of Tenon, especially of those expansions of the same to the walls of the orbit, which contain muscular fibers and which oppose the backward pull of the recti. The original wound, according to the same, produced an inflammation of the supra-orbital nerve, from which it extended to the sympathetic root of the ciliary ganglion producing paralysis of the sympathetic and consequently of these muscular fibers and retraction of the globe (preponderance of the recti).

The temporary exophthalmos has occurred in those abnormal communications between the nasal and orbital cavity (regular emphysema of the orbit, as in Rampoldi's case), and in alterations of the orbital veins. The author excludes the first hypothesis for the simple reason that the symptoms could be reproduced at any time by compression of the jugular vein, and accepts the other of a pathological state of the orbital veins. These, according to some writers, become varicose after a trauma, or easily distended by losing their normal tone when the sympathetic nerve is affected.

R.

Bacteriological Researches of Kerato-Hypopion (Bacillus Pyocyaneus, Bacterium Coli.)

BIETTI, DR. AMILCARE (*Annali D' Ottalmologia Fasc.*, May 6, 1906). In ulcers of the cornea, and especially in ulcers serpens, the most common form found has been the pneumococcus of Fraenkel. Next in frequency are the diplo bacillus of Morax-Axenfeld, lephotrix, bacillus pyocyaneus, bacterium coli.

The author reports two cases in which he has demonstrated the presence of the last two ones. In the first, an ulcer produced by trauma, the culture of the pus evacuated through a Saemisch incision produced characteristic colonies of pyocyaneus. The inoculation of these on the cornea and in the anterior chamber of rabbits developed great virulence on the eyes thus subjected. Therefore this micro-organism is of a destructive nature, according to the author, and consequently when present, is apt to develop violent inflammation of the ocular organ. In the second case, another traumatic ulcer, with moderate infiltration of the base with hypopion the culture revealed the bacterium coli, which with experimental inoculation sometimes produced severe infection, some others very mild reaction.

Two cases have been reported of affection of the cornea and especially by hypopion-keratitis, in which the bacterium coli has been recognized as the cause, one belonging to zur Nedden, the other to De Berardinis.

R:

SOCIETY PROCEEDINGS.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of November 20, 1906, Dr. G. E. de Schweinitz, Chairman, presiding.

Dr. T. B. Holloway read *A Review of the Treatment and Its Results of 129 Cases of Gonococcic Conjunctivitis in Adults and Infants in the Philadelphia General Hospital During the Past Six Years.*

He presented a statistical study of 129 cases of gonococcic conjunctivitis which have occurred in the services of the attending ophthalmic surgeons of the Philadelphia General Hospital during the past six years. Seventy-two cases, or 106 eyes, presented gonococcic conjunctivitis, and 27 cases, or 109 eyes, conjunctivitis neonatorum. Dr. Holloway described the bacteriologic tests, the condition of the cornea on entrance, and the ultimate vision secured in these various cases, and also made a study of the cases of gonoblenorrhoea which have occurred in young children in the same institution during the same period of time. Particular attention was paid to the method of treatment which had been used, and it was found that, among those cases of gonococcic conjunctivitis in which the corneas were clear when the patients entered the hospital, nitrate of silver was employed in 31 cases, with subsequent corneal involvement in 8, or 25.8%; argyrol in 20, with corneal involvement in 4, or 20%; protargol in 4 with no subsequent changes; nitrate of silver and argyrol in 6, with corneal involvement in 2, or 33.3%. Among the cases of conjunctivitis neonatorum, 95 eyes were free from corneal involvement upon admission, and only 11 of these developed corneal changes while under observation. Fifty of these eyes were treated with nitrate of silver, with subsequent corneal involvement in 6, or 12%; 14 were treated with argyrol, with subsequent corneal involvement in 1, or 7.14%; 16 with nitrate of silver and argyrol, with subsequent corneal involvement in 2, or 12.5%. In 13 eyes no silver preparation was used, and none of these developed any abnormality of the cornea. All of the attending surgeons preferred nitrate of sil-

ver in gonococcic conjunctivitis, and in the majority of the severe infections the silver salt was used. The elaborate statistical material which comprised the paper cannot be presented in an abstract, and only a few of the main points are therefore cited.

Dr. Pyle called attention to the value of solutions of acetozone and alphozone in purulent conjunctivitis. He had used the latter with success in the strength of 1:500 as an application, and in the strength of 1:2500 as a collyrium.

Dr. Hansell complimented Dr. Holloway for his careful collection of statistics, and the manner in which he had presented them. He thought that in comparing the results of treatment at Blockley with those of other institutions the character of the patient should be considered. As a rule, those in Blockley were in a poor physical condition, and in children especially this had an important bearing upon the results which could be obtained. In answer to a question, Dr. Hansell said that he always used solutions of potassium permanganate, and made applications of silver nitrate in the cases under his care.

Dr. Posey discussed the subject of vulvovaginitis in little girls and its importance in causing infection of other children. At one time during the past summer the wards of the Children's Hospital had to be closed because of an epidemic of this disease. He emphasized also Dr. Holloway's point on the occurrence of arthritis after gonorrheal conjunctivitis.

Dr. de Schweintiz, referring to Dr. Holloway's statement that there had occurred in the Philadelphia General Hospital a little over 2.1% of ophthalmia neonatorum among more than one thousand deliveries, stated that it must be remembered that these deliveries were not in one service, and that all of the chiefs on duty were not in the habit of using Credé's method. Where Credé's method was used the percentage of ophthalmia neonatorum was much lower in this hospital. While he believed that Credé's method was essential in all cases in which the birth canal was known to be infected, or from which the suspicion of infection could not positively be eliminated prior to the birth, it was not necessary when infection or the suspicion of infection could be excluded. Under these circumstances milder measures were much preferable.

Dr. de Schweintiz fully indorsed the value of scarification of the hard ring of conjunctival edema which was apt to sur-

round the corneas of cases of gonorrheal conjunctivitis in adults, and referred to Dr. Robert Randolph's observations as to the advantage of this procedure. He also indorsed the use of cold in suitable cases, provided there was no depreciation of the general nutrition, at least for the first thirty-six hours, not in every case of ophthalmia neonatorum, but in almost all cases of gonorrheal conjunctivitis of adults. He thought, however, that a good deal of experience was necessary to decide whether or not cold should be used. Often in ophthalmia neonatorum of infants it was not necessary.

He reiterated his previously expressed belief that no remedy had thus far been discovered which could replace in value, properly applied nitrate of silver in the treatment of gonorrheal conjunctivitis of adults. He insisted, however, upon a correct technic, and fully realized the disadvantages which surrounded this excellent remedy. Inasmuch as abundant investigation had demonstrated that argyrol was either entirely or practically without any bactericidal qualities, the advantages claimed for this drug in the treatment of purulent conjunctivitis could not reside in any action that it had upon the micro-organisms, but as it is a bland remedy and by its use the secretion in the deeper folds of the conjunctiva is floated to the surface and more readily removed, it is of service, and as an adjuvant to the nitrate of silver is a useful remedy. It must be used in fresh solution, and the surface of the conjunctiva kept bathed in the fluid, especially as recommended by Dr. Bruns, of New Orleans, and Dr. Standish, of Boston. That it could not replace nitrate of silver, however, he thought was abundantly demonstrated, certainly in his own experience and in that of his colleagues in the Philadelphia General Hospital.

Dr. de Schweinitz continued to be impressed with the value of permanganate of potassium as an irrigating fluid in cases of gonorrheal conjunctivitis of adults, although he did not use this remedy in ophthalmia neonatorum, which under ordinary circumstances is readily managed by milder applications, and it is particularly in this disease that argyrol and similar drugs are of service, largely because they are unirritating. Nitrate of silver, however, even in these cases, if they are gonorrheal in origin, is frequently essential.

Dr. Risley said that his views agreed entirely with those which Dr. de Schweinitz had expressed. He believes that silver nitrate is the most reliable drug in the treatment of gon-

ococccic conjunctivitis, and that much harm has been done in neglecting its use. At the same time he recognizes that its careless application is a source of danger. In the use of cold, he varies the treatment according to the physical condition of the patient, using it when the patient is robust, but preferring hot applications in cachectic individuals.

Dr. Wm. Campbell Posey read a paper on *Some Unusual Ocular Manifestations of Gonorrhea*. Published in full, p. 71.

Dr. de Schweinitz, referring to Dr. Posey's first case, thought it interesting that the infection had apparently proceeded from the inflamed sphenoidal sinus to the conjunctival sac. The reverse, namely, that a gonorrheal infection passes from the conjunctiva into the lacrimal sac, or more deeply into the nose, appears to be most uncommon. He had seen very deep-seated infection of the orbit under these circumstances, and referred to Suker's case of infection of the anterior ethmoidal cells, which began with an apparent orbital cellulitis on the fourth day after the onset of the conjunctivitis, and which required opening and draining of the ethmoidal cells for its relief. He thought that certain statistics as to the frequency of gonorrheal conjunctivitis as a complication of urethral gonorrhea were inaccurate, and that the disease was more frequent than many genito-urinary surgeons were inclined to believe, doubtless because they did not see the cases of gonorrheal conjunctivitis, as they were more apt to occur in those who neglected their gonorrheas, and did not seek relief for their urethral affection, and therefore were not included in statistical tables.

Dr. Pyle called attention to the reported cases of arthritis following gonorrheal infection of the conjunctiva. Dr. Shumway thought that the infection of the eyes in Dr. Posey's first case was more likely due to infection by the fingers, as the experiments of Bach and Hauenschild had seemed to show that organisms do not pass from the nasal chambers to the eye through the lacrimal passages, although their passage from the conjunctival sac to the nostrils in conjunctivitis was constant.

Dr. Posey, in conclusion, said that the infection on each occasion started apparently in the immediate vicinity of the canaliculi, and indicated, he thought, an infection through the lacrimal canal, and not by the fingers. He believed that gon-

orrhoea would be more often found to be the cause of mild types of conjunctivitis, and of iritis, if the histories were carefully investigated.

Dr. Frederick Krauss read a report on two cases of *Pari-naud's Conjunctivitis*, and exhibited one case. Published in full, p. 81.

Dr. G. E. de Schweinitz and Dr. C. M. Hosmer (by invitation) read a paper on *Melanotic Flat Sarcoma of the Chorioid, with Unusual Clinical Symptoms*. The patient, a woman, aged 42, for one year prior to her examination had noted failing vision in the right eye, and on several occasions had had attacks characterized by neuralgic pain, edema of the lid, localized edema of the conjunctiva, and injection of the ocular conjunctiva over the edematous area. During the intervals the eye had been comparatively comfortable, and at the time of the attack there had been apparently no rise of tension. Examination revealed two detachments of the retina, one in the upper portion of the fundus, which was covered with small, brownish-black spots, and which did not float forward into the vitreous, and another in the extreme lower periphery of the fundus, upon which these black spots were not present. Transillumination confirmed what ophthalmoscopic examination already indicated, namely, the presence of a growth of the chorioid. The eye was enucleated, and a flat, mottled, brownish-black tumor was found lying upon the inner surface of the sclera, and extending from the angle of the anterior chamber to within five or six millimeters of the nerve entrance. It was 2.5 mm. in thickness. The growth was made up of stellate cells and chromatophores and diffusely involved the chorioid, the ciliary body, the extreme periphery of the iris, and the angle of the anterior chamber and sclera. The inner layers of the sclera were also infiltrated. In places there was a distinct alveolar arrangement of the cells. On the side of the tumor the filtration angle was closed, and on the other side it was evident that the root of the iris had been in contact at one time with the ligamentum pectinatum. Partial occlusion of the vortex veins was also demonstrable. The intermittent attacks of neuralgic pain associated with localized edema of the conjunctiva were similar to those reported in connection with a case of diffuse melanosarcoma by Dr. Charles Kipp. The authors thought it probable that these recurrent edemas

were the expression of a glaucomatous attack, even though there was no demonstrable increased intra-ocular tension at the time, because, in their case, at least, there were evidences of occlusion of the filtration angle on one side, and such a condition of affairs that there must have been temporary occlusions upon the opposite side, as well as similar partial occlusions of the vortex vein. The value of transillumination was dwelt upon, and this case was emphasized as another example of those described by Dr. J. Herbert Parsons, who found that the retina may be detached, or, rather, elevated by the growth, in one portion of the eye, while in another portion there is a second detachment of the retina, separated from the chorioid by an albuminous exudate. The authors also briefly referred to the cytology of diffuse sarcomas of the chorioid and the method in which they grow in contrast with ordinary tumors of this nature.

Dr. G. E. de Schweinitz and Dr. C. M. Hosmer (by invitation) demonstrated an eyeball with *Recurring Iridokeratitis and Posterior Staphyloma*. The eye had been blind for many years, and the patient had always been myopic. The eyeball was irregular, with a low, rounded bulging of the equatorial region lying between the superior and external recti muscles. A second staphylomatous process was evident on the temporal side of the optic nerve. From the center of the cornea to the nerve entrance was 27 mm.; from the center of the cornea to the apex of the corneal staphyloma, 29 mm.; the vertical diameter of the eyeball was 24 mm.; and the horizontal diameter 25.5 mm. Microscopically there were the evidences of parenchymatous keratitis, chronic cyclitis, atrophy and narrowing of the chorioid, detachment and degeneration of the outer layers of the retina, and great thinning of the sclera, especially at the posterior staphyloma. The optic nerve was distorted and atrophic.

Dr. Howard F. Hansell read a paper on *Extraction of a Fragment of Steel from the Vitreous; Purulent Hyalitis; Recovery*. The patient had been struck on the eye three days before examination by a piece of pig-iron which, he said, was fully $\frac{1}{2}$ inch square. No wound could be found in the cornea or sclera, but there was marked iridocyclitis, and an exudate in the pupil obscured a view of the eyeground. Although the presence of a foreign body in the eye did not seem prob-

able, a radiograph was taken and revealed a foreign body near the floor of the vitreous. An incision through the sclera was followed by the escape of pus, and when the magnet-tip was introduced a small fragment of iron, 1 mm. square, was removed. A solution of 1:10,000 bichlorid was injected into the vitreous and the conjunctiva sutured over the opening. The inflammation subsided, and the patient left the hospital in a week. The cornea and lens were clear, the pupil was dilated, and a whitish exudation could be seen in the posterior part of the vitreous. Dr. Hansell emphasized the importance of radiographic examination in all cases of injury by foreign bodies, although there may be insufficient grounds for believing that the foreign body is within the eye. He considered the case interesting also in demonstrating the curative value of injections into the eye of strongly antiseptic solutions, despite the presence of an active purulent process.

Meeting December 18, 1906. Dr. G. E. de Schweinitz, Chairman, presiding.

Dr. Frederick Cheney, of Boston (by invitation), read a paper on *Treatment of Glaucoma Simplex (Iridectomy, Sympathectomy, and Myotics)*. He said that normal tension as determined by palpation should not in any way contra-indicate operation in glaucoma simplex. A tension might be normal throughout the entire course of the disease and nevertheless be a pathologically high tension for the eye under consideration. The fact that a glaucomatous cup has been produced should be sufficient proof that the optic disk is subjected to greater interocular pressure than it is capable of resisting, and also that, if the disease is to be brought to a standstill, it is essential to lessen the so-called normal tension and to make it subnormal.

Dr. Cheney thought that iridectomy was the rational treatment, and if we could operate as early in this form of the disease as we are enabled to in many of the acute congestive cases, the results would be capable of a more favorable comparison. In a disease which is often so slowly progressive, the life probability, as indicated by the patient's age, general physical condition, and ancestry, may be the deciding point in a given case. An eye which does not offer the most favorable conditions for operation may nevertheless demand iridectomy in early life, and an eye that in an elderly individual seems in

every way favorable for operation is often best let alone. The first and most important question, therefore, to be answered in each individual case by the man who is favorably disposed toward operation is: Are the chances of retaining vision to the end of life better with iridectomy or by the continued use of myotics? In many of the cases met with in the middle period of life, say from the 45th to the 60th year, the problem may be a most difficult one to decide. The chances of prolonging vision by myotics to the end of life is only exceptionally favorable, and there is, on the other hand, the possibility of an operation destroying an eye at a time when its vision is often of the greatest importance to the continued welfare of the individual and his family. With useful vision still remaining in both eyes, iridectomy should, he believed, be advised in one, and the question of the second decided after a sufficient time had elapsed to determine the success or failure of the first.

In monocular glaucoma the question of operation on the second eye, which is slightly, if at all, involved, is an important one and was ably presented by Dr. de Schweinitz, in a paper at the meeting of the American Ophthalmological Society in 1901. His suggestion in regard to simple glaucoma was: "In cases of chronic simple glaucoma, if any periods, however temporary, of increased intra-ocular tension can be demonstrated according to the methods already suggested, operation should be performed even if central and peripheral vision are perfectly intact. Even when these are normal, careful perimetric examination may reveal a scotoma of the character already described; if so, operation should not be postponed."

If one eye has been operated upon, if useful vision remains, and if a sufficient time has elapsed to make it fairly certain that the process has been brought to a standstill, if the patient's age and other conditions make it probable that a considerable number of years of life are reasonably to be expected, then Dr. Cheney would certainly agree with Dr. de Schweinitz in advising operation on the second eye at the earliest possible moment after all doubt had been removed as to the existence of the disease. So favorable a condition of affairs, however, is only exceptionally met with. As a rule, in his experience when the disease is not found to be well established in both eyes, one eye is blind, or so nearly so that there is little or no chance of operation giving useful vision. When one eye is blind and

the disease beginning in the second eye, myotics are, as a rule, he believed, to be preferred in the latter part of middle life and old age so long as the disease remains apparently stationary or is very slowly progressive.

While Dr. Cheney believed that a successfully performed iridectomy approaches nearer what might be regarded as a cure of simple glaucoma than any other form of treatment, he nevertheless operates on the smaller proportion of the cases which come under his care. A certain number of patients refuse operation. In others the eye presents conditions unfavorable to operation, and, again, in a disease which is essentially one of latter middle life and of old age, myotics offer such a favorable probability in many cases of prolonged vision for years or to the end of life that one often hesitates to recommend an operation which may end disastrously. In a certain percentage of the cases met with the pupil is well contracted, and the value of myotics under such conditions is a debatable one. It is to be remembered, however, that these cases are usually seen by the oculist under conditions most favorable to a small pupil; that is, good illumination. Good illumination is not constantly present, however, and especially is this so when that frequent affliction of old age exists, insomnia. Hours of wakefulness in the dark or dim light may be accompanied by hours of more or less pupillary enlargement and perhaps some increase of tension. Myotics can certainly do no harm even if the pupil is contracted to its smallest size, and periods of dilation may thus be prevented.

Dr. Cheney reported two cases of double superior cervical sympathectomy, but did not think the results could be considered as favorable to the operation.

In opening the discussion Dr. Posey said that the issue under discussion was expressed by the question, "Is simple chronic glaucoma combated in its early stages best by operation or by other measures?" He referred to a paper which he had read at the last meeting of the American Medical Association in which he had called attention to the very satisfactory results which attend the use of myotics in chronic glaucoma, and urged their more intelligent and persistent administration. The action of these drugs was dwelt upon and their value when properly applied was demonstrated by citing cases illustrative of various types of chronic glaucoma, and the assertion was

made that if it were possible to compare an equal number of cases which had been subjected to myotics properly administered over a similar period, the comparative merits of myotics and iridectomy would be shown to be far greater in favor of the former.

To obtain the maximum amount of benefit from myotics Dr. Posey insisted, however, upon their continuance and their proper administration, in the manner, in fine, which had just been described by Dr. Cheney, and wished to make it clear that if inflammatory symptoms should arise at any time, iridectomy should be performed. He said that for him the one indication for operation was the development of symptoms of a congestive nature, but he contended that if the pupil is kept constantly contracted almost to a pin-point and proper care is given to the general health and the use of the eyes, that such symptoms will arise but rarely in cases of a purely chronic type.

He found justification for the pursuance of this line of treatment in a statistical study of a large series of cases of chronic glaucoma treated with myotics which had been compiled by Dr. Zentmayer and himself from Wills Eye Hospital clinics, and by the continuous observation of a not small number of cases in other hospital and private practice.

If myotics have the power to stay the glaucomatous process, can one therefore feel justified in advising operation in cases of chronic glaucoma which are free from inflammatory symptoms? It may be said repeatedly and by eminent observers that iridectomy is practically without danger, and yet surely no surgeon of experience really believes that it is a simple or harmless procedure. It is, of course, true that few eyes are actually lost from the operation, but would not the statistics of a hundred cases of iridectomy for glaucoma show lenticular haze in greater or less degree in a very considerable proportion?

Comparative statistics which show the results of operation and myotic treatment in a large number of cases can alone solve the problem, and here lies the difficulty, for the disease is comparatively uncommon, and since, as a rule, it affects those who are advanced in years, death often ensues before the observation can be extended over many years, even where the subjects of the disease remain constant in their attendance on one surgeon, so that one observer can scarcely acquire sufficient data from his own practice to draw conclusive results.

Dr. Posey suggested that a committee be appointed from the section for the purpose of collecting data from its members, of cases of simple chronic glaucoma which they have had under observation for five years or more in their own practice and which they have subjected to operation or myotic treatment.

Dr. S. D. Risley said that there could be no question that there was room for two opinions as to the relative value of myotics or iridectomy in the treatment of glaucoma simplex. He thought it possible, however, that the uncertainty which surely existed in the minds of many experienced surgeons was the result of the ill-defined diagnostic line of demarcation between certain forms of chronic glaucoma, always threatening to pass into the congestive or inflammatory type, on the one hand, and, on the other, the cases of atrophic nerves with glaucomatous cupping and no demonstrable increase of tension as compared to that of the average eyeball. Dr. Risley recalled the fact that not many years ago no ophthalmic surgeon of note even considered operative interference in simple glaucoma, regarding it as not only useless but harmful. But tonight the conservative paper to which all had listened with great interest, gravely discussed it, with a distinctly favorable trend toward iridectomy. This fact was a strong indication that experience had not condemned operative interference. Dr. Risley said that his own experience had led him to favor iridectomy. Indeed, the circumstances were exceptional in which he could feel that he was doing his full duty by his patient if he did not advise it as soon as the advancing symptoms made clear the nature and obvious progress of the disease. While it could not be denied that he had repeatedly seen the disease held in check by the faithful, judicious use of eserine salicylate, still there had always been more or less advance in the symptoms. He considered it a refinement of cruelty to consign these patients to the life-long anxiety of possible blindness, or operation, either or both of which were suspended like a Damoclean sword over their heads, of which the instillation of drops morning, noon and night for years kept them in constant terror. With this the rare accidents attending skillfully performed iridectomy were not to be compared. Dr. Risley regarded iridectomy, however, as useless if not performed with a faultless technic. To his mind the coloboma should include the root of approximately one-sixth of the iris. He had but rarely seen accidents follow the operation in simple glau-

coma, and the lens, if not injured, had rarely become opaque, unless the process had already begun.

Dr. Hansell said that the successful treatment of glaucoma or of any other disease could not be empirical or accidental, and must be based on an understanding of the nature of that disease. The etiology, the morbid changes in the affected tissues, its relation to other local or general affections, and particularly its dependence upon them should be observed. Moreover, the number of cases carefully studied should be sufficient to form a basis for classification.

In his study and teaching of the subject of glaucoma he had adhered to the classification generally adopted for the primary forms, the acute and chronic inflammatory and the simple or non-inflammatory. For years he had had scruples against including the latter in the category of the glaucomas, for in none of his cases had he been able to determine the presence of the attributes of glaucoma. The excavation had been a constant symptom, and blindness had been the invariable outcome in those patients who had not died of an intercurrent disease, but increased intra-ocular tension had never been a constant symptom, and, indeed, he had not been able to convince himself that it ever existed in a degree that could not be considered to be within physiological limits. He had come to believe that Horstman is correct in relegating the affection back to Graefe's classification as "amaurosis with excavation." We are told that all the signs and symptoms of inflammatory glaucoma are the direct result of pressure, whatever might have been the original cause of that pressure. Now, when we compare the clinical picture of inflammatory glaucoma with that of glaucoma simplex, we find that, with one exception, the signs of intra-ocular pressure are wanting. We have no pain, no steamy cornea, no shallowness of the anterior chamber, a contracted rather than a dilated pupil, no transient blindness from paralysis of the retina, and estimation of the tension by the most experienced fingers or the most accurate tenometer will not prove beyond question that the tension is higher than normal excepting in high myopia or those cases in which the blood-pressure is exalted or where the sclera, by reason of age or loss of elasticity from other causes, is more rigid than normal. Again, the etiology of glaucoma simplex is even more obscure than the etiology of the inflammatory form. A consideration of a partial list of causes of inflammatory glaucoma would

probably lead to their rejection from the etiology of simple glaucoma.

Moreover, the treatment by iridectomy, so valuable in the inflammatory forms, had been in his hands as well as in the hands of others without value in simple glaucoma. He had performed the operation and he supposed he would continue to do so until something more logical is suggested, for the reason that it has been recommended by the highest authorities and he might blame himself if he left it undone. The value of eserine, universally prescribed, is problematic. If there is no increase of tension and the pupil is small, the danger of the blocking of the angle of the anterior chamber is no greater than in an eye not suspected of being glaucomatous. The contraction of the pupil and the forced activity of the ciliary muscle induced by eserine would seem to have but little place in the therapy of simple glaucoma. Extirpation of the cervical ganglia, in his limited experience, had also been without effect in relieving blindness or even in checking the advance of the disease.

Simple glaucoma is certainly not much glaucoma and even less simple. Its clinical history is well known, the structural changes are constant, but its etiology, its relation to the general nervous system, and its successful treatment are yet to be discovered. He believed it to be akin to other imperfectly understood forms of atrophy of the optic nerve and a symptom of a progressive disease of the nervous system.

Dr. Zentmayer said that from personal observation alone he would be unable to decide as to the relative merits of the two principal methods of procedure under discussion, as in his experience simple glaucoma, always infrequently met with, is yearly becoming less common. As pointed out by Dr. Hansell, we know so little definitely as to the etiology of this affection that it is useless to speculate as to the cause for this, but it had occurred to him that the careful refraction work that has been done in this country in the past thirty years had been a factor. His earlier views as to the comparative value of iridectomy and eserine in the treatment of simple glaucoma were formed as the result of the clinical study to which Dr. Posey has referred. His later experience had not led him to radically change the opinions there expressed.

From what has been said tonight and from other sources it would seem to him that the counts against iridectomy may be

stated to be that statistics show that iridectomy is not infrequently followed by immediate and permanent impairment of the visual functions, not dependent upon trauma; that it has been the experience of most operators to have had rapid development of cataract after what appeared to have been a technically correct operation; that the danger from infection, although slight, is not to be ignored; that there is produced a considerable degree of changing astigmatism.

Against the myotic treatment we have: that it favorably influences a smaller percentage of cases than does iridectomy (myotics, 80 per cent.; iridectomy, 90 per cent.; that the treatment calls for a degree of persistence and a discipline not always possible to obtain; that at times it sets up a very troublesome conjunctivitis which may require the withdrawal of the drug.

Weighing these objections, and taking into consideration that to the post-operative use of eserine must be attributed some of the benefit now credited to the iridectomy, he believed that the myotic treatment should be the method of choice, and that iridectomy should be reserved for special cases. If the patient were one who would probably fail to carry out the rather irksome myotic treatment; or one who could not be kept under constant observation, he believed it would be best to do an iridectomy. If in spite of the use of myotics the disease continued to progress, and if the disease occurred in a comparatively young individual, he would advise iridectomy. In general the class of patients one meets with in the dispensary will give the larger percentage of cases in which iridectomy is suitable, and private practice a larger percentage in which the myotic treatment will best serve.

The value of any method of treatment will be enhanced by attention directed toward the vascular and general system, abnormal conditions of which play an important part in the production of this affection.

Dr. de Schweinitz, referring to those cases of chronic glaucoma with apparently no increase of intraocular tension, thought that careful observation would always demonstrate at some period of the disease periods of increased tension. The symptom may not be constantly present, indeed, is often absent, or it may be present at one portion of the day and not at another, or be present during the night and not during the daytime, and he urged a more thorough investigation of this

phenomenon. Referring to the field of vision in this disease, Dr. de Schweinitz was of the opinion that no satisfactory results were obtained until it has been investigated in a much more thorough manner than was commonly employed; in other words, that even if perimetric examinations with ordinary white test-objects were alone employed, defects in the field of vision and the presence of scotomas might not be discovered which would be uncovered if, for example, the method of Bjerrum was employed, or if the field of vision was mapped under reduced illumination, or if the light sense of the periphery of the retina was tested, for example, with quadrants of light gray, having four-fifths of the intensity of the white card on which they were placed, such, for example, as have been designed by Ward Holden. The importance of the discovery of these defects by these delicate tests early in the disease and the danger of assuming that a field was continuing to be normal because defects were not found by the ordinary comparatively coarse tests were pointed out.

Dr. de Schdeinitz fully agreed with those who believe in the value of myotics, and in cases unsuited to operation, either because of the age limit or on account of surrounding conditions, ocular and otherwise, they were of the utmost importance. Dr. de Schweinitz insisted on their systematic use, so that the pupil is kept contracted, and if possible, especially in elderly persons, at least one instillation should be made during the night. He agreed with Dr. Cheney that pilocarpin yielded more satisfactory results than eserine in this disease, or, at least, equally satisfactory results with less disagreeable consequences. He was, however, unconvinced that myotics were always preferable to iridectomy in so-called simple glaucoma, which had by careful study been differentiated from that disease with which it was most often confounded, namely, some form of optic nerve atrophy with cupping. He granted all of the disadvantages and dangers of iridectomy, but even taking them into consideration, he felt satisfied that in a certain number of cases the disease was not safely intrusted to myotic treatment, and that a carefully performed iridectomy, if it was sufficiently peripheral and technically correct, and which need not be a broad one, was likely longer to hold the disease in check than medicinal measures. He thoroughly agreed with Dr. Cheney, however, that it was not necessary to perform iridectomy simply because the disease existed, but that each case

must be submitted to the most careful study, and the question of myotic treatment versus iridectomy decided upon the results of this study. He called attention to the early signs of the disease, to the fact that it probably appeared long before it was discovered with the ophthalmoscope, and particularly to the early depreciation of light-sense, as had been so well described by Wahlfours. Dr. de Schweinitz also called attention to the fact that many cases of so-called chronic glaucoma had reached the age in which peripheral striae in the lens were apt to appear, and that it was possible that in some of those cases in which chronic glaucoma, as is so frequently the case, takes on an acute process and passes into a congestive glaucoma, might be due to swelling of the cataractous lens.

Dr. Ziegler said that observation of his own patients and those of other surgeons who had been treated by myotics had led him to the conclusion that operation offered the best chances for holding the disease in check. He referred to patients in whom after iridectomy the vision had been preserved for many years; and to one case particularly in which the diagnosis had been uncertain between simple glaucoma and atrophy of the nerve with cupping; five or six years later the patient developed an attack of acute glaucoma, and, despite operation, became blind. Recently he had been impressed with the value of sclerotomy. In some cases he had done an iridectomy on one eye and sclerotomy on the other, and he thought better results were obtained by the sclerotomy. In a few cases he had performed both operations on one eye. In sclerotomy there is less danger of intraocular hemorrhage, and the operation is certainly to be preferred where vascular disease makes such a disaster to be feared.

Dr. C. A. Veasey stated that, among men of experience, it had always seemed to him that one followed that particular line of treatment in any given disease which had proved in his own practice the most effective. He had always been guided in the question of operative procedure more by the condition of the visual field than by any other symptom. If the use of myotics and optic nerve stimulants failed to check the progress of the disease, and the visual field continued to contract, or scotomata appeared, he usually advised operation, and his preference was for iridectomy. On the other hand, if the field remained comparatively stationary, no scotomata appeared, and central vision continued good, the myotic treat-

ment was continued indefinitely. If the patient was very old and had, in all probability, only a few years in which to live, and it was likely that useful vision would be held during life, or if the patient was not in good physical condition to recover from operation, the medicinal treatment was employed. Dr. Veasey added that his experience with cases in which scotomata had appeared and the visual field was constantly contracting was, unfortunately, not so good when the myotic treatment was employed as that of some of the preceding speakers. In fact most of such cases lost their useful vision in a few years, so that upon the first appearance of such symptoms he advised operation, other conditions being favorable, because in about 50 per cent. of these cases good visual conditions were maintained by this procedure.

Dr. Cheney, in closing, said that the question of subnormal tension in glaucoma simplex was an interesting one, and while it was a condition which hardly seemed compatible with this disease, it would, he was confident, be occasionally met with. He had been especially interested in Dr. Posey's cases. Through his kindness he had seen one of his patients every summer for the last five years, and the results, as to the condition of field and vision, had certainly been everything which could be desired up to the present time. There is one factor which must not be lost sight of, however, in drawing conclusions as to the value of myotics, and for that matter of iridectomy as well, and that is the often exceptionally slow progress of glaucoma simplex. It is probable that in many cases the disease has existed for eight, ten or more years before the patient is conscious of the fact and consults an oculist. That is, there is a slowly increasing cup of the disk long before there is a contraction of the field or failure of central vision. If one discovers this early cupping during the routine ophthalmoscopic examination of refraction cases, it is, of course, desirable to advise some form of treatment, but in such cases the entire credit must not be given the remedy or operation, even when the disease apparently comes to a standstill for a considerable period of time.

Meeting January 15, 1907. Dr. G. E. de Schweinitz, Chairman, presiding.

Dr. George C. Harlan showed *A Case of Spontaneous Gangrene of the Eyelids*. The patient was a well-nourished, previously healthy boy, four years of age. The attack had come

on suddenly with a swelling of the lids of the right eye, which in two days involved the right side of the face and head, as far back as the ear. The child had not been in contact in any way with animals or their secretions, and the other members of the family were healthy. Examination four days after the onset showed an abrasion of the upper lid; the lid was of a violet color and there was an intense edema of the lids, face and head on the right side. The eyelids of the left side were edematous, but there was no swelling of this side of the face. The child was restless and fretful; the temperature was 101° and later 103° ; pulse, 124. Urine examination was negative. The discharge that oozed from between the lids contained great numbers of pneumococci, but no other bacteria could be found.

A number of deep incisions were made down to the bone (a depth of one and one-half inches), from which serum, but no blood, flowed, and the swelling was greatly reduced. Marked improvement in the general condition followed, the temperature falling in a few days to 99° . The skin of both lids became black and necrotic, and in a few days sloughed, leaving a granulating surface. The treatment consisted in quinine and good diet, free incisions of the lids, and the application of flaxseed poultices, made with 0.5 per cent. solution of carbolic acid. After the sloughs separated, tarsorrhaphy was performed.

Dr. de Schweinitz spoke of the interesting pathological results which have been reached in the examination of some of these types of so-called malignant edema, either as they followed an injury or as they arose apparently as an idiopathic affection, and stated that in some of them diphtheritic bacilli had been found, and under such circumstances the ordinary serum-therapy would be indicated. He also referred to a case of ulceration of the skin and subcutaneous tissues, not of the lids, but of the arms and trunks, which he had observed, in which almost pure cultures of the bacillus pyocyaneus had been found. He did not know whether a similar observation had been made in any of these gangrenous processes of the lid.

Dr. Posey exhibited a case showing *Abnormal Contraction of the Eyelids, in Association with Movements of the Jaw*, occurring in a Hebrew girl who had complained of dizziness and headache after near work. The right lid had drooped from birth, and it had been remarked that in mastication the

lid upon that side would move up and down. The ocular movements were good and unrestricted in both eyes, with the exception of an overaction of the right superior rectus muscle, which was dependent upon a paresis of the right inferior rectus muscle. The irides and the ciliary muscles were unaffected in both eyes. Vision was also normal, both eyes being slightly hypermetropic. No motion was communicated to the lid by simply opening the mouth, nor were the eyeballs themselves affected by this act. There were no palsies of the muscles of the face.

Dr. Posey referred at length to a paper by Sinclair, who had observed 6 cases and had divided all cases in the literature into various groups. Of 32 cases analyzed by this author ptosis was present in 27 instances and doubtful in 1, and of the 27 cases in which ptosis was present the superior rectus was parietic in 10. The condition has been noted as hereditary in several instances. It is not always congenital, for cases have been remarked which appeared in later childhood. The explanation of the association is difficult and is still hypothetical, owing to the absence of autopsy. The most reasonable theory is to the effect that the levator receives nerve supply from the motor nuclei of the fifth nerve as well as from the nuclei of the third.

Dr. Posey showed also a case of *Chronic Ophthalmoplegia Externa*, occurring in a girl sixteen years of age, who was otherwise well and strong. Ptosis of a marked degree was present upon both sides; when both eyes were fixed, the right eye was directed straight ahead while the left was slightly divergent. All motion was abolished except downward, the globes being movable in that direction to the extent of 2 mm. Vision was practically normal and the irides and the ciliary muscles functioned perfectly. Dr. Posey said that this rare disease develops generally in infancy or early in childhood, without symptoms indicating involvement of other parts of the nervous system, and slowly progresses until all or nearly all of the extraocular muscles, including the levator, are palsied. The course is essentially chronic. Both eyes are affected, though rarely simultaneously. The affection should not be termed "infantile nuclear atrophy," as the manifestations often do not appear until late in life.

Dr. Posey pointed out the difficulty in differentiating cases of this nature from congenital palsies of eye muscles, but stat-

ed that this could be frequently done by the presence of secondary deviations in paralytic cases. As no uncomplicated case has come to section, the pathogenesis is still obscure. The condition, however, is best explained by a slow necrosis of the nervous elements, evidencing itself in an atrophic condition of the ganglion cells in the nuclei, with secondary atrophy of their nerve fibers.

In conclusion, he pointed out that although in many cases the nuclear degeneration which occasions the ocular palsies does not progress further, it is not unusual for the ophthalmoplegia to form part of a more general process and to be but the ocular manifestation of tabes or other diseases of the cerebrospinal system.

Dr. Zentmayer presented *A Case of Chronic Nuclear Ophthalmoplegia*. The patient was a male, thirty-four years of age, married and the father of four children, three of whom were dead, the one living being six years of age. Occupation, cook. He noticed a drooping of the right upper lid five months ago. He had been unable to read with the left eye for the past six months, but could still do so with the right eye. Fifteen years ago he had venereal disease, probably chancreids. Until eight or ten years ago he was troubled with headache and one year ago he had boring pains in both tibiae. He never had had diplopia; he had no symptoms other than those ocular, pointing to intracranial disease. Dr. Weisenberg reported that the neurological examination was entirely negative, all of the cranial nerves, not ocular, being normal, and there was no loss of power or alteration in sensation. The K. J.'s were normal; the urine contained neither sugar nor albumin.

Corrected V. of R. E. = 6/10; L. E. = 6/6. With each eye p. p. = 20 cm. with + 4 D. Visual fields were normal.

On the right side there was complete palsy of the third and sixth nerves. Slight power was still retained in the fourth nerve. On the left side the third nerve was incompletely paralyzed; the iris had been spared, but the ciliary muscle was much impaired, while the levator was weak and the sixth nerve was paralyzed. The action of the superior oblique was impaired, but not so markedly as in the right eye. There was at times bilateral vertical nystagmus. The fundi were normal except for slight pallor of the disk in the right eye.

He was placed upon K. I. in ascending doses, which had not been well borne. At present the condition was much the same as at the time of the first visit, except that there was apparently more power in the right levator and that the iris on the left side was paralyzed.

Dr. Zentmayer reported also *A Case of Unusually Extensive Involvement of the Cranial Nerves in Tabes*. The patient, a man fifty-one years of age, stated that objects first appeared double two years ago, but that the double vision disappeared when the right lid drooped some months later. He complained of numbness in the feet and legs, of some pain, and of girdle sensation. R. E. V. = 5/10; L. E. V. = 5/10. On the right side there was complete external palsy of the third nerve and of the fourth nerve. On the left side there was paralysis of all of the external muscles supplied by the third nerve except the levator. On both sides the irides responded promptly to convergence impulse, but to concentrated light only. Both nerves were decidedly red-gray. The visual fields showed very little contraction. V. was unimproved by glasses. Dr. Weisenberg's report on the neurological conditions was briefly as follows: "Romberg's sign; some hypotonus of all of the joints, especially of the lower limbs; sensation of touch diminished over both feet, front of each tibia, and the chest; sense of position and muscle sense disturbed in the lower limbs; some ataxia of the upper limbs; all tendon reflexes lost, even by reinforcement; bladder and rectal disturbances; sensation for touch and for pain diminished in the distribution of the right fifth nerve."

Dr. de Schweinitz, referring to Dr. Posey's case of movement of the eyelids in association with movements of the lower jaw, thought it interesting to place on record an observation which he had made in the Philadelphia General Hospital, in a patient whose right orbicularis contracted markedly in association with movements of the eyeballs to the right, that is to say, there was an associated contraction of the orbicularis with contraction of the right external rectus and left internal rectus. The case will be reported *in extenso*.

Dr. Harlan referred to *A Case of Associated Movements of the Eyelids and Jaw which he had reported several years ago*. The condition in his case was not congenital, and the contraction of the levator muscle was more pronounced than in Dr.

Posey's case, especially when the jaw was moved in a direction away from the eye affected.

Dr. E. V. L. Brown of Chicago (by invitation) presented a paper on *The Anatomic Changes (Uveitis Proliferativa, Fuchs) in Three Cases of Ophthalmia Sympathetica*, and with slides and drawings corroborated Fuchs' recent findings that the essential change in the eye which causes sympathetic inflammation of its fellow is a proliferation of epithelioid cells *within* the confines of the iris ciliary body, or chorioidea, and which he named uveitis proliferativa in contrast to the fibrinoplastic exudation upon the uveal surface in ordinary traumatic uveitis not producing sympathetic inflammation of its fellow. (The paper will appear in full in a subsequent number of the *Archives of Ophthalmology*.)

Dr. Shumway said that Fuchs' paper, in which he claims that the characteristic changes in an eye producing sympathetic ophthalmia were proliferation of the cells of the uveal tract, and not the ordinary plastic exudation, marked a distinct advance in the study of the pathology of the disease. Dr. Brown's findings apparently were confirmatory of those of Prof. Fuchs, and it remained to be seen if further investigation showed that a separation of the two conditions was justifiable. Dr. Shumway referred to Ruge's reply to Fuchs' paper, in a recent number of *Graefe's Archives*, in which he disputed Fuchs' findings in many particulars, and adhered to his belief, which corresponds with Schirmer's that plastic inflammation and the condition producing sympathetic ophthalmia were not separate entities, but differed in degree rather than in character. Ruge further denied that the chorioid was the part chiefly affected, and challenged the statement that superficial plastic inflammation could not be produced by a sympathetic process, unless accompanied by a mixed infection, and claimed that chorioidal sarcomas were not capable of producing a true sympathetic inflammation. Dr. Shumway spoke also of zur Nedden's experimental paper, in which he had reported the production of a chronic plastic inflammation in animals' eyes by the injection of portions of tissue from eyes producing sympathetic disease, and also of blood serum from the patients into the vitreous body of the animals. Zur Nedden had also obtained an organism, of the pseudo-diphtheria class, from the rabbit's vitreous, which he had been able to cultivate, and by

injection into other eyes produce the same chronic plastic inflammation.

Further, that he had been able to check a sympathetic process in a patient under observation, by subcutaneous injection of serum from another patient who was recovering from the disease. Dr. Shumway thought that zur Nedden's results, if confirmed, were even more valuable than Fuchs', because they might be of assistance in the clinical study of the process.

Dr. de Schweinitz said that not the least important point which Fuchs had developed in his remarkable paper was his elimination of the time limit in sympathetic ophthalmia, which was a matter of very great clinical significance.

Dr. John T. Carpenter exhibited a patient with *Extensive Incised Wound of the Sclera*. The patient, a butcher, was injured by the accidental thrust of a long, narrow-bladed knife, with which he was cutting meat. The cut extended along the cheek upward through the sclera, making an incision through the eyeball, extending from the lower conjunctival cul-de-sac to the cornea. As the man objected to enucleation, one scleral suture and several conjunctival sutures were inserted. Considerable reaction followed, with milky white opacity of the cornea, but the eye gradually quieted down, the cornea cleared, and the eyeball was now painless and almost free from injection. He reported the case on account of the extent of the wound and the remarkable recovery, which was unique in his experience in injuries of such a character.

Dr. Harlan said that some experiences which he had had with eyes injured by cuts through the ciliary body had led him to be very cautious in the retention of such eyeballs, on account of the danger of sympathetic trouble. It was, of course, possible for the man to escape sympathetic disease, but he considered the eye a very dangerous one.

Dr. de Schweinitz said that he considered the case a very remarkable one on account of the extent of the injury, and that it showed that it was wise, when the scleral wound was very long, to introduce one scleral suture, which could be removed in two or three days. He thought that the entire absence of inflammatory symptoms, including discoloration of the iris, was a point in the man's favor, and made the eye a safer one than it would otherwise be. The edema of the cornea had been very marked, and there was an enormous chemosis, which rapidly subsided on the fourth day, with the dis-

charge of a yellowish-brown serum. The case also proved the value of the administration of mercury and large doses of salicylate of sodium under such circumstances.

Dr. de Schweinitz made some remarks on *Glaucoma Following a Subconjunctival Injection of a Solution of Cyanid of Mercury*. After referring to Mazet's case of glaucoma as the result of a subconjunctival injection of iodat of sodium, he recorded the following observation: A patient, twenty-six years of age, with uveitis of syphilitic origin, who had been under treatment for a month and who had greatly improved under the administration of iodides and mercury and scopolamin mydriasis, was given an injection of 8 minims of a solution of cyanid of mercury, 1 to 5000. Within twenty minutes after the injection, associated with intense pain, the eyeball became exceedingly hard, tension + 2; the cornea, previously clear, steamy; and the eyeball, previously white, greatly injected; while vision, which had been 6/20, fell to hand movements. Under the influence of hot compresses and the instillation of a 1 per cent. solution of pilocarpin, frequently repeated, the attack gradually subsided without the necessity of operative interference, and had practically passed away at the expiration of four hours. On the following day, except some tenderness in the neighborhood of the injection, all symptoms had disappeared and vision was quite as good as that recorded prior to the injection. Before the use of the cyanid of mercury, the patient, on a number of occasions (about a dozen), had received subconjunctival injections of normal salt solution, and, therefore, this attack of increased intraocular tension following the subconjunctival injection could not be attributed to any psychic disturbance, which, curiously enough, had been one of the explanations given in the discussion which followed the presentation of Mazet's case. Moreover, it was well known and had been experimentally demonstrated that subconjunctival injections could cause rise of intraocular tension, although the original curve indicating the rise is soon followed by a fall.

Dr. Shumway spoke of the great value of dionin in reducing the tension of eyeballs, especially where there was an inflammatory exudate or blood in the anterior chamber, and cited several cases under treatment at the University Hospital clinic, in which temporary hypertension had been promptly lowered by its use.

Dr. Pyle reported 3 cases of acute glaucoma caused by a mydriatic, 2 of which had yielded to the use of dionin, pilocarpine, eserine, and hot compresses, while the third required posterior sclerotomy. He had come to consider dionin of great value in such cases, and with heat and the myotics almost a specific for the reduction of tension. Dr. Pyle distinguished between artificially induced acute glaucoma and acute exacerbations of chronic glaucoma, in which latter he had no experience with dionin.

EDWARD A. SHUMWAY, M. D.

Clerk of Section.

THE CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of Dec. 11, 1906.

DR. GEO. F. FISKE, PRESIDENT.

DR. G. F. SUKER: Ptosis sympathica in a young child, marked by incomplete paralysis of the levator, and flushing of the lid-skin; the globe is small and of minus tension with no disturbance of motility.

DR. A. E. BULSON, JR., (Ft. Wayne, Ind.): "*Further Report on the Successful Use of Tuberculin in a Case of Iritis Tuberculosa.*" Both the local and general diagnostic tuberculin reaction were obtained early in the case and the six or seven reddish-brown iris-nodules have disappeared under tuberculin treatment, although the cornea is still hazy. Mixed antisymphilitic treatment had had no effect. Dr. B. has under observation a corneal ulcer which he thinks was induced by tuberculin used for the diagnosis of tubercular laryngitis. He is, however, a believer in the use of large diagnostic doses when small doses give no results.

DR. R. REMBE (by invitation): *A Case of Cysticercus of the Anterior Chamber.* E. B., age 7, presented a translucent, spherical tumor lying on the infero-mesial surface of the R. iris between axes 255° and 15°, measuring about 3 mm. across, and almost completely filling out this quadrant of the chamber. Distinct motion was observed by Dr. R. in the long axis of the mass before atropin was used to combat the slight iritis present. The mass was removed by a forceps through a corneal incision. Additional circumstantial evidence that the tumor was a cysticercus is furnished by facts that (1) the boy lives in a small colony of about 900 Westphalian Germans near Chicago, who eat quantities of uncooked pork in the shape of Westphalian sausage; (2) the local physician has treated twenty cases of tapeworm among these people within the year; (3) the community subsists almost entirely on vegetable—or "truck" gardening—and all human fecal matter is used for fertilizer, and (4) the boy states that he often pulls up radishes and other vegetables by the roots, eating them after barely wiping off the dirt with his hands. (Published in extenso in the Ophthalmic Record, January, '07.)

DRS. W. E. GAMBLE AND E. V. L. BROWN: *Further Report on the Case of Iritis Tuberculosa as Diagnosed and Treated by Koch's Tuberculin.* Twenty-one months of quiescence and unimpaired function followed the six months of treatment which had resulted in the complete disappearance of two large tubercular iris-nodes; these had given repeated typical local reactions to tuberculin after failure of anti-syphilitic treatment. The patient has gained sixteen pounds. (Vide Jour. A. M. A., Oct. 14, 1905.)

DR. W. E. WILDER: *Tuberculosis of the Cornea—CASE 1.* A deep central keratitis of the L. E. responded promptly to ordinary treatment. Six months later, the lower part of the R. cornea was attacked by a similar process, and the keratitis was soon complicated by the development of five or six small nodes in the adjacent iris. The disease progressed during the succeeding three weeks despite doses of potassium iodid increased to 50 grs. t. i. d.; 5 mg. of the old tuberculin gave a general reaction, although no certain local reaction could be identified because of the very marked ciliary injection already present; however, the quiet fellow eye gave a local reaction, and tuberculous keratitis was diagnosed. Three months' use of the old tuberculin, beginning with a dose of 0.018 mg. and gradually increasing to 18 mg. resulted in a perfectly cleared cornea and 20/20 vision.

CASE 2. C. Y., age 47. An infiltration of the middle layers of the cornea bordered by striae radiating between the adjacent lamellae, and extended from the lateral quadrant to the central portion with restoration of an epithelial defect. A diagnostic dose of 5 mg. of the old tuberculin gave a general, but no local reaction. New tuberculin was then used therapeutically for seven months, beginning with 0.0018 mg. and increasing to 128 mg., with the result that good vision was restored, although considerable opacity of the cornea remained.

Dr. W. Exhibited two further cases, one of probable uveitis, hyalitis and cataract, and one of long standing "serous" iritis, both of which had given the general and local reaction. Dr. W. believed there is ample justification for doubt that general febrile and local reaction mean tuberculosis of the part.

DR. H. B. YOUNG (Burlington, Iowa): *Tuberculin Injections in a Case of Retinitis, Probably Due to Cerebellar Tumor.* A child of ten developed an almost typical albuminuric retinitis

during the course of profound general disturbance; the latter greatly improved under four months' treatment with 1 mg. injections of the old tuberculin.

DR. W. A. EVAN: (by invitation): From his extended experience, Dr. E. is firmly convinced of the reliability, safety and absolute necessity for the diagnostic use of tuberculin. He employs one 5 or 10 mg. dose of old tuberculin after a week or so of careful study of the pulse rate and temperature; he gives the injection late at night, so that the period of greatest local and general reaction will occur during the following day time.

Meeting of Feb. 12, 1907.

DR. F. C. HOTZ, PRESIDENT.

Antepartum Purulent Conjunctivitis. WILLIS O. NANCE reported a case observed within the first twenty-four hours of life. Even at birth the eyes were swollen and red, and a drop of yellow matter oozed from the left eye on opening the lids. One day later, the eyes presented a clinical appearance of a well-defined purulent conjunctivitis of several days' duration; the upper lids were so swollen as to render eversion extremely difficult, the palpebral conjunctiva was velvety and presented deep furrows, the eyes were bathed in creamy pus, and the left cornea was slightly hazy. The discharge showed gonococci in abundance. The disease ran a favorable but protracted course of seven weeks. The mother was a primipara, aged 22; labor had been brief and easy, the membrane having ruptured one and one-half hours before birth. The infant weighed eight pounds, and was decidedly cyanotic.

N. is of the opinion that the gonococci were introduced directly through the unruptured membranes of the amnion, and that the ophthalmia was immediately due to an endometritis of the same nature.

A Hysterical Girl Who Placed Broken Pieces of Glass in Her Eye.

DR. C. W. HEATH reported the case of a sixteen-year-old girl who secretly placed some forty pieces of glass in her conjunctival sac on various occasions in order to arouse the sympathy of the attendants in the institution in which she was detained. No injury of the cornea resulted, although some of

the fragments must have remained in the eye over night. All the stigmata of hysteria were found.

Optic Neuritis Closely Associated with a Lesion of the Sinuses

DR. G. F. SUKER: When first seen, the patient was suffering from a bilateral optic neuritis with beginning atrophy on one side; a month later the vision suddenly fell to 0.1 in each eye, despite very energetic strychnin and mercurial treatment. An examination then revealed some congestion of the nasal mucosa, and some interference with the sinuses. Curettage of the ethmoidal sinus revealed pus and necrotic tissue; vision immediately improved, and is now 0.6 and 1.0 respectively.

DR. H. M. FISH had seen the case with Dr. Suker. Dr. Fish emphasized the fact that negative nasal findings are inclusive since cases have been reported in which only congestion of the nasal mucosa was present a few hours before death, but in which the sinuses were found filled with pus post-mortem.

DR. F. E. BRAWLEY has seen the vision improve from 0.5 to 0.66 within a half hour in a case of slight neuroretinitis associated with a mucous discharge from the nose. Normal vision was restored under treatment.

DR. J. E. COLBURN has seen marked lowering of vision from operation under the turbinal bodies—in one case from normal to 0.1 over night with subsequent return to normal.

DR. F. A. PHILLIPS has seen a marked disturbance of vision, blurring of the disk and general hyperemia of the fundus accompany acute sinusitis due to influenza. The eye condition subsided on the improvement of the sinusitis, but recurred when it again appeared. Dr. Phillips believes the retinal affection to be due to a disturbance of the chorioretinal circulation.

DR. J. F. BURKHOLDER cited a case of complete and permanent blindness, one eye, due to a turbinetomy which was followed by severe hemorrhage, and a three days' loss of consciousness.

DR. F. C. HOTZ added a case of thrombosis of a central vein, and retinal hemorrhage with permanent loss of the upper half of the field of vision, due to exceptionally profuse hemorrhage occurring three days after an operation on the turbinals. The operation and vascular lesions may well have been merely coincident.

A Split-Flap for the Repair of Both Lids:

DR. E. F. SNYDACKER has used a large split-flap for this purpose after an operative sacrifice of a large portion of both lids in carcinoma. The flap is cut into halves, the one to restore the upper lid defect, and the other to restore the lower lid defect, the pedicle forming the outer canthus. Dr. Snyderdacker has been unable to find any record in the literature of others who have used this procedure.

Paralysis of the Third Nerve.

DR. G. F. SUKER reported a case of paralysis of the third nerve of specific origin, the lues having been contracted thirty years ago. A short time ago the patient had a pseudo-apoplectic attack, and the following day there was complete ptosis of the upper right eyelid. The patient is taking 30 to 50 grams of sodium and applying 25 to 30 grams of mercurial ointment daily.

E. V. L. BROWN, *Secretary.*

A meeting of the Wills' Hospital Ophthalmic Society (Philadelphia) was held at the hospital on the twenty-second of October, 1906, Dr. S. Lewis Ziegler presiding.

Dr. Frank Fisher reported a case of bullous keratitis in which, after having tried various forms of treatment, he believed that it would be best to perform an iridectomy, although his experience in the past was against the procedure. Dr. Charles A. Oliver favored the operation, basing his feelings in regard to the procedure upon the good results which had been obtained by him in somewhat similar conditions. Dr. Ziegler thought that attention to the tear passages with a subsequent iridectomy would be the best line of therapy. Dr. Harold G. Goldberg stated that in his hands dionin in five per cent. strength solution had been of value in some cases which had come under his observation.

Dr. Fisher exhibited an interesting case of traumatism from a fragment of tool or coal which had been inflicted two weeks previously. The foreign mass had torn through the lower outer corneal edge and ciliary region of the right eye. There was a localized opacity of the crystalline lens and adjacent capsule in the wounded area. Intraocular tension was normal. The case being a new one in the hospital, it was the consensus of opinion of those present that the X-ray should be immediate-

ly used and attempts made, if possible, to remove the foreign mass, do an iridectomy, and remove the lens; the case to be reported upon at the next stated meeting.

Dr. Oliver exhibited a curious type of traumatism in which the corneo-scleral limbus and the underlying iris had sustained a clean cut incision from a large piece of steel that had not penetrated any further into the eyeball. The two flaps of the wound were situated upon different planes and levels. The anterior chamber was closed. There was no reaction. The wound healed. Radiographs failed to show the presence of any foreign body in or around the eye, and the patient recovered with the restoration of the parts to their normal position with a scar which was only visible by strong concentration of light and high magnification. There was full vision and large uninterrupted fields. Treatment had been limited to the use of iced compresses, atropin and rest in bed.

Dr. Oliver showed a case which he had seen two hours after an accident, and in which a drop of eserin had been instilled, carrying a small iris prolapse back into its normal position, and giving a round pupil without any appearance of traumatism other than a small slightly concentric vertical cut through the cornea. The following day, the patient reported with a localized iritis, a spongy deposit upon the anterior capsule of the lens, and a deep mass of lymph in the bottom of the anterior chamber. Vision was reduced from practically normal to light perception. The patient was immediately admitted to the hospital and placed in bed. Hot compresses were employed, and changeable iridoplegics and cycloplegics were used. All of the signs of inflammation subsided, and the patient, one week after he had been injured, recovered with full acuity of vision, two small posterior synechia in the position of the previously bruised iris alone remaining. He brought the case before the society to illustrate a principle which he and Dr. Fisher had established in their hospital services a number of years ago—to immediately excise all prolapses of the iris tissue, no matter how small or recent they might be. Dr. Fisher agreed with Dr. Oliver in reference to the advisability of such a procedure, and had made it an unalterable rule to do this in all cases of this kind since the time mentioned.

Dr. Ziegler spoke of a case with the history that a piece of steel had been driven into the eye several years previously, cataract developing. The patient had been in the hands of a

practitioner who had failed to make use of X-ray study. The moment that Dr. Ziegler saw the case, he ordered radiographs to be made, with the result that a foreign body within the eyeball was recognized. The mass was immediately removed, the cataract extracted, and vision with glasses was brought to almost normal; thus proving the direct advantage of X-ray study in every suspicious case.

Dr. McCluney Radcliffe made mention of a case in which two sets of negative studies with the X-ray had been made in spite of the fact that he felt sure clinically that a foreign body was within the eyeball. A third series of plates gave an undoubted shadow with its localization. Immediate operation was resorted to, and a foreign body was successfully removed, leaving an useful and unirritated eye. The foreign body was two millimeters square. He also spoke of some rare types of traumatic cataract in which there was not any apparent external wound. In two cases that he had seen, the character of traumatism was extremely slight, one being the result of the shaking of a piece of light dress goods in which a closed eye lid was struck, and in which a resultant cataract was most probably caused by capsular breakage.

Dr. Oliver gave a brief account of a case that he had seen two weeks previously, in which the findings of a carefully made X-ray study coincided exactly with those from a series of examinations of the visual field; it being his rule whenever possible to have the field of vision gone carefully over by a competent assistant. In this instance, a peripherally situated scotomatous area of positive type, sharply cut in outline, made him feel that either a small section of the optic nerve had been injured or the adjacent retina had been seriously wounded. The foreign mass, a piece of steel some fourteen millimeters in length, most accurately located by Dr. William M. Sweet, showed that its posterior extremity was protruding through the posterior portion of the eyeball some two millimeters to the temporal side of the globe and that it had cut the optic nerve in actual relationship with the lost portion of the field. An incision in the proper place being made, the foreign body was withdrawn upon the first essay of the magnet.

An informal discussion upon the use of iced compresses in cases of traumatism, both accidental and purposive, gave some interesting facts in regard to the first establishment of this

form of practice in the hospital. Drs. Fisher, Oliver and Ziegler related some details as to their difficulty in overcoming the many objections offered to the plan that they had encountered during the introduction of a method which is now so universally employed in the hospital, and which has met with so much success.

Dr. Goldberg gave a very carefully detailed account of a number of bacteriologic experiments which he had made with several different makes of cosmoline. As one of the results, he had found among a great number of experiments that certain kinds of cosmoline seemed germ free. His work, pursued with alkaline, acid and neutral materials, gave findings which induced him to cover eyeballs that had been opened by traumatism with large masses of the germ free variety of drug. As a result, it is in his belief, that these types of material are of value in the treatment of open eye wounds, protecting them from the entrance of extraneous and harmful bacteria. He has now advanced sufficiently in the work as to make clinical studies, some of which are in active progress. Thus far he has found that healing is more perfect and much more prompt with the use of the material than it is with other methods. In a number of his cases he had noticed that the patient had experienced the taste of the drug. Dr. Ziegler made mention of the fact that he had seen the drug employed empirically by others, and that he remembered that Dr. William F. Norris formerly used it to advantage in the hospital.

Dr. Ziegler gave a brief history of a case of melano-sarcoma about as large as a small bean situated at the corneo-scleral junction of the left eye of a middle aged man in whom, six months previously, the growth appeared as a minute pigmented plaque. Immediate excision of the growth had been advised. At present the mass is lobulated, densely pigmented, and covers one-third of the cornea. The eyeball is involved and there is considerable injection. Just beneath the principal growth there is a small carnified nonpigmented mass which presses into the lower lid.

BOOK REVIEWS.

The Muscles of the Eye.

By LUCIEN HOWE, M. A., M. D., Buffalo, N. Y. Published by G. P. Putnam's Sons, New York. Vol. I. Cloth, \$3.75.

The completed work will consist of two volumes. The present volume has to do with Anatomy and Physiology; including instruments for testing and methods of measurement.

The author states the reasons actuating him in writing the book to have been: First, the collection of data relating to this subject, separating as clearly as possible demonstrated facts from statements based on theory; second, to formulate these facts concisely, and in the simplest terms possible. A careful reading of this volume shows the author to have accomplished his purpose.

Original matter includes the importance attached to the secondary insertions of the muscles. The author classifies these into *lateral*, *ocular* and *orbital*, not including in these the check ligaments or the fascia orbita ocularis; illustrations by photographs of dissections of the muscular insertions; a simplified method of recognizing the malposition of the lens with the ophthalmometer; the clinical importance of the accessory muscles of accommodation; another ophthalmotrope; the measurement of the lifting power of the adductors; the clinical measurement by photography of the rate of the lateral movements; the distinction between the actual and the apparent static position; between the minimum and maximum dynamic conditions; and a very complete statement of the measurements of the relative accommodation, convergence and torsion.

Much space is given to a study of the maximum and minimum effects of the cycloplegics, mydriatics and miotics and the subject might well have been given a separate chapter. The value attributed by the author to the action of the determined minimum dose of these drugs seems to be more theoretical than practical.

Great clinical importance is attached to a study of relative accommodation—the author says: "In our studies of the pathological conditions of the muscles we shall find the most important and apparently the most frequent anomalies are those which involve the ciliary muscle."

In this volume of the work there can be, of course, very little which enters controversial territory, but where disputed subjects are treated, the author either leaves the subject *sub judice*, or his teaching is conservative and shows the author to have profound respect for the promulgations of Helmholtz, Hering, Le Conte, Donders and other pioneers in ocular physiology.

The illustrations, on the whole, are good; those in the chapter on Nerve Supply being especially helpful. The photographs of the dissections are not entirely convincing.

The appendix contains besides a very full bibliography, much that is of interest, but not invaluable; for instance, a gallery of portraits of eminent students of ocular muscles, and a list of ophthalmic journals in certain American libraries.

Careful proof reading and good mechanical work add much to the pleasure of reading the book. W. ZENTMAYER.

Tumors of the Cerebrum.

On sale by Edward Pennock, Philadelphia.

This is a bound collection of seven contributions (all of them published elsewhere) to this subject, by Drs. Charles K. Mills, Charles H. Frazier, William G. Spiller, George E. de Schweinitz and Theodore H. Weisenberg. A similar symposium upon Tumors of the Cerebellum appeared in 1905, by the same authors, excluding Dr. Spiller, and including Dr. Edward Lodholtz. In these two little volumes tumors of the brain are discussed from every standpoint, and they constitute a very useful and valuable addition to the literature of that important subject. *The Focal Diagnosis of Operable Tumors of the Cerebrum*, is discussed by Dr. Mills; *Remarks upon the Surgical Aspects of Operable Tumors of the Cerebrum*, by Dr. Frazier; *Cerebral Decompression*, by Drs. Spiller and Frazier; *The Ocular Symptoms of Tumors of the Cerebrum*, by Dr. de Schweinitz; *Conjugate Deviation of the Eyes and Head, and Disorders of the Associated Ocular Movements*, by Dr. Weisenberg; *The Significance of Jacksonian Epilepsy in Focal Diagnosis, with some Discussion of the Site and Nature of the Lesions and Disorders causing this Form of Spasm*, by Dr. Mills, and the *Motor Area of the Human Cerebrum, its Position and Subdivisions with some Discussion of the Surgery of this Area*, by Drs. Mills and Frazier.

Of special interest to the ophthalmologist are the articles on decompression, the ocular symptoms of cerebral tumor, and conjugate deviation of the eyes and head.

Dr. Spiller's conclusions upon cerebral decompression, or palliative operation in the treatment of brain tumors, which are based on fourteen personal cases and a review of the literature are as follows:

1. Palliative operations should be performed early in every case in which symptoms of brain tumor are pronounced, and before optic neuritis has advanced far, especially when syphilis is improbable or antisyphilitic treatment has been employed.

2. Partial removal of a tumor, especially of a glioma, is a questionable procedure.

3. Palliative operation does not under ordinary circumstances cause atrophy of a brain tumor, and probably does not arrest its growth; on the other hand, it probably does not hasten its growth.

4. Palliative operation is not to take the place of a radical operation when the latter can be performed without great risk to the patient.

5. In some cases, the symptoms of brain tumor disappear almost entirely for a long time or permanently after a palliative operation. This result is obtained either by relief of intracranial pressure, or by removal of some lesion (meningitis serosa, etc.), other than brain tumor, and yet causing the symptoms of tumor.

In treating of the ocular symptoms of cerebral tumor, Dr. de Schweinitz confines himself to a consideration of papillitis or choked disk, and visual field phenomena. The recent work of Leslie Paton, and of Kamperstein is frequently referred to as well as that of other observers.

Dr. Weisenberg has studied sixteen cases of conjugate deviation, fifteen of which came to autopsy. His paper includes in addition, a very complete review of the important literature on the subject. From his own observations, he draws fifteen conclusions, some of which are at variance with other more or less prevailing theories.

WM. T. SHOEMAKER.

NEWS AND NOTES.

EMIL JAVAL died in Paris on January 19th last. The death of this scientist calls to attention a life well spent, and one which may be a lesson to those overcome as he was by adversity. For the last twenty years of his life, Javal was afflicted with glaucoma which terminated, despite the most skilful care and attention, in absolute blindness.

That good might come to others through his misfortune, he thereafter devoted much of his life to a study of the possibilities for usefulness and pleasure accessible to the blind. In a production entitled *Entre Aveugles*, which can now be had in almost any language, one is told explicitly how to be blind, and still get from life a world of pleasure and usefulness.

Javal was born in 1839. After qualifying as an engineer in the Paris School of Mines, he took up the study of medicine, graduating in 1868. He is perhaps best known to the ophthalmic profession by his ophthalmometer, which although in strict accord with the principles introduced by Helmholtz, was for many years a popular model.

In a monograph *Numerotage des Verres de Lunettes*, published in 1877, he proposed to number lenses by their focal distances, using the present diopter as a unit. He also wrote a manual on Strabismus. His latest publication which is of recent date, is a work called *Physiologie de la Lecture et de l'écriture*.

Javal served in the Franco-Prussian War as surgeon; was a member of the Academy of Medicine, and at one time was a member of the Chamber of Deputies.

A CORRECTION.

February 24, 1907.

To the Editor of the Annals of Ophthalmology.

Dear Sir: In the October number of the ANNALS, which I have just received, I notice an excellent abstract of a paper upon *Tuberculosis of the Chorioid* published in *Die ophthalmologische Klinik* of October 25, 1906. The original, according to your reviewer, purports to be by G. Carpenter. In point of fact, the original communication was the joint work of Dr. George Carpenter and myself.

On page 568 of the same number of the ANNALS there is a review of a paper by one "Stephens" on "*A Form of Amblyopia in Young Children consequent upon inherited Syphilis*;" the communication in question was, however, the work of

Yours faithfully,

SYDNEY STEPHENSON.
24 Thayer St., London.

Dr. John F. Woodward of Norfolk, Va., records as follows two interesting cases. *Case 1*, Complete Anophthalmos was seen in consultation with Dr. Riddick of Norfolk, September, 1905. The patient was a boy baby four months old, fully developed in every way except the eyes. The family history on both sides was good; there was no history of other congenital anomalies in either branch of the family. The mother knew of no fright or shock or conversation with sightless people, or of anything that might have left a maternal impression. The lids and palpebral fissures were normal, the sockets were well developed, and looked as if some round object at one time had occupied them. The child slept perfectly both day and night, and took its nourishment as well as any normal child. The only evidence of sight that the mother noticed was that the child was the first to awaken in the morning when the sun rose, and became restless if light were allowed to suddenly enter the room.

Case 2. In 1905 a man from Mathews County came to see me about his left eye. Just ten days before he had been treated for pneumonia by Drs. Vaiden and White. Three days before I saw him his lid began to swell, and the pain in the eye was intense. This continued for two days when he experienced some relief from the pain, but the eye was severely congested and the lid much swollen. When I saw him, there was decided edema of the conjunctiva and a little pus formed constantly in the inner canthus. It looked like a general infection of the eye at first, as the pus was distributed along the borders of the lids. On manipulation of the lids and eye, the pus seemed to ooze from beneath the caruncle. A probe passed so directly into the eye that I was convinced that the pus came from inside the eye. The eye was removed and I found that the pus started from near the central artery, and had pushed its way between the sclera and chorioid till it reached the parts just between the ora serrata and the iritic border, where it broke through and found its way out from beneath the caruncle. The vitreous was cloudy and slightly disorganized.

To me these cases are interesting in that they may occur at all. The anophthalmos was complete, and the infection from the pneumonia seemed to occur in the very last stages of resolution.

AMBLYOPIA. ANISOMETROPIA. SQUINT.

Dr. Charles H. May's Book.

In a work on the eye, 1905, Charles H. May, M. D., gives the profession fine illustrations, plates and colored figures, and thus far is entitled to the claim of originality set forth in the preface.

But, unconsciously perhaps, the text of the book in places seems to present as the author's own discoveries, material which was some time ago written up and discussed in medical journals.

On page 240 of Dr. May's book occurs: "* * * 'Probably in many of the so-called congenital cases, the amblyopia is really acquired. * * * The most careful correction of the error of refraction fails to produce normal vision; in young patients, however, the sight can frequently be improved or brought up to the normal after *suitable glasses* have been worn for a time.'" On page 308 occurs: "* * * In such cases, if the poor eye still possesses vision, the patient should be advised to exercise it daily with the aid of a suitable lens, the good eye being excluded, so that the amblyopic eye may retain its vision and the defect prevented from becoming worse."

In 1899, an article indicated congenital amblyopia to be an improbability¹. "Amblyopia may never be congenital". Acquired functional amblyopia was described in 1898². "It attacks all ages". "Many are affected with this amblyopia and see better with one of the eyes than with the other, even with perfectly fitting glasses". "* * *, the proper glass is necessary in this form of amblyopia * * *". "* * * in most cases constant wearing of ground glass is indispensable, * * * these induce use of the amblyopic eye * * *". Illustrated.¹

On page 308 occurs: "When the difference in the refraction is not great (1 to 2D.) * * *, we may give each eye its correction. Even when the difference is greater, correcting lenses will often give satisfaction; * * *."

"When the axis of the astigmatism is estimated to within three degrees and the susceptible ametropia corrected to within

0.25D., there is probably nothing to prevent an anisometrope using both eyes simultaneously for near or far vision". See also 7.

On page 340 occurs: "Non-operative treatment of squint is successful in a large proportion of cases of convergent concomitant squint, *if made use of sufficiently early.* * * * *Operative Treatment.* If non-operative measures do not overcome the deviation in six months to a year, *operation* is indicated."

The above does not occur in Dr. May's preceding edition. "In confirmed crosseye persistent use of spectacles, atropine, bandage, and the ground glasses * * * makes fewer operations" "Surgical methods should not be resorted to, even in adults, until all other methods fail". Squint treatment, lessening the need of the knife, was published in practical working order in 1901". Until spectacles alone prevent squinting, the better eye should not be free from bandage, atropine, or opaque glass; some one of these constantly enforcing use of the worse eye. "As much care is taken in bandaging, as after major operations on the eyeball". The time-tried patch or bandage commonly used does little good.

It seems unfair to quote only the editor of Dr. May's British edition, concerning squint, page 336, inasmuch as accepted facts and untried theories, given to science by other writers, are used in Dr. May's book, unconsciously perhaps, without quotation or reference.

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THE ANNALS OF OPHTHALMOLOGY.

Vol. XVI.

APRIL, 1907

No. 2

SOME OF THE RARER OCULAR LESIONS ASSOCIATED WITH GOUT OR GENERAL LITHEMIA.*

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The medical mind is at present decidedly mixed in its views as to the causation of certain gouty manifestations, and what influence uric acid in the blood may have in bringing them about.

It is admitted that the blood of gouty patients contains an appreciable amount of uric acid. It is also admitted that before an explosive inflammatory attack of gout, there is less elimination of uric acid in the urine, which later may be followed by an excretion of an excessive amount.

We recognize that uric acid is produced from the nucleoproteids, coming not only from the nucleins in the food taken by the patient, but also from the nucleins in the cellular tissue through perverted metabolism, and it is the latter alone which is increased in gouty patients. One plausible theory here presented is that toxemia resulting from this faulty metabolism is of intestinal origin, due to fermentative processes.

The excess of uric acid present in an acute inflammatory attack of gout no doubt acts both as a toxic agent and as a mechanical irritant upon the tissues, though there is a possibility that other toxins are generated at the time which play a part in the process. In the present confusion of our ideas as to

*Read before the New Haven Medical Society.

the real nature of gout, it is evident that our views as to the proper treatment of these gouty manifestations must be somewhat hazy.

It is reasonable to suppose that foods which contain large amounts of nuclein, and which consequently tend to develop an excess of uric acid, should be greatly limited in quantity. Yet abstinence from all albuminous material seems an unnecessary hardship. It is undoubtedly a sound rule which eliminates from the diet of gouty patients everything which is not easily digested.

According to *Woods Hutchinson*, the gouty diathesis means the possession of a sufficient degree of resisting power on the part of the protective cells of the body to oppose the entrance of any toxic agent, with consequent destructive metabolism and the production of uric acid, but not sufficient to neutralize or prevent its partial or complete absorption. As most of the toxins, which set up this destructive metabolism, and the production of uric acid, are of intestinal origin, the diet should be regulated wholly with reference to the diminution of intestinal fermentation.

As uric acid is but little or not at all toxic in itself, the prohibition of foods rich in nuclein is of doubtful utility.

The drugs found of value in gout owe their efficacy chiefly to their power of checking intestinal fermentation and putrefaction, or of preventing the absorption of the products of this fermentation, or of promoting their elimination.

Turning to another phase of the subject, the well-known cardio-vascular changes met with in chronic lithemia, it is now generally recognized that the continued perversion of function of any part of the body leads to structural change. Compensatory growth has its limit, and the resulting compensatory tissue tends to early decay.

In the altered condition of the vessels in chronic lithemia, arterio-fibrosis constitutes the compensatory stage, while arterio-sclerosis is the secondary process of degeneration.

If we decide to recognize gout as a localized expression of uric acid retention, it probably takes a prominent part in the causation of arterio-sclerosis.

In the smaller arteries, as in the eye, for example, muscular tissue predominates in the media, and strain begets hypertro-

phy as arterio-fibrosis. This strain, or increased blood-pressure, is the cause of fibrosis and sclerosis, and this is assigned to contraction of the arterioles, resulting from the toxic action of retained products of metabolism. Here, arterio-fibrosis is the compensatory hypertrophy, while arterio-sclerosis is the ultimate degeneration. This condition once established, the question of relative weakness determines when and where the weakened vessel wall yields to dilatation, or aneurysm, or rupture. Increased arterial tension is the causative factor, and thickening of the arteries is one of the results.

As a matter of fact, however, high blood-pressure does not always mean an already developed arterio-sclerosis, for at first the consequences are only functional.

Owing to the widespread extent of this high blood-pressure throughout the body in chronic lithemia, and the resulting arterio-sclerosis, almost any organ in the body might be regarded as alone at fault, and not infrequently the eye has been considered the sole or main seat of the disease. We should rather regard it as presenting the extension of the diseased arterial condition in one special direction.

The influence of high blood-pressure on the functions of any organ in the body may be recognized if carefully looked for. For instance, in the eye, the symptoms of this high blood-pressure and arterial degeneration would be a loss of the power of accommodation, transient blurring of the vision due to diminished circulation and retinal edema, sudden impairment of the vision from retinal hemorrhage, or hemorrhage into the vitreous, and paralysis of one or more of the extrinsic ocular muscles. All these are conditions of recognized toxic origin.

It is my belief, based on long observation of a great many cases, that it is a mistake to regard gout as directly responsible for the vascular lesions met with in the eye in gouty patients. The true view to take of these cases is that the nitrogenous products of metabolism are the cause of both the arterial degeneration and the gout.

The significance of this high blood-pressure as we see it in these cases is that it leads directly to the vascular changes which belong normally to old age. The modern strenuous life, particularly in large cities, with its impaired metabolism, imperfect elimination or excretion, the resulting toxemia and

vascular changes, are directly responsible for these conditions.

A condition of general lithemia usually manifests its presence by typical inflammatory attacks in the joints and tendons of the muscles. But we also meet with various lesions of the skin, mucous membranes and viscera in this systemic dyscrasia, and the ophthalmologist often has to deal with various lesions of the eye, associated with gout.

Some of the rarer manifestations in the eye of the lithemic condition, to which I wish to call attention, are conjunctivitis, edema of the eyelids, chorioiditis, retinitis, optic neuritis, and affections of the ocular muscles. All of these ocular lesions, especially the conjunctivitis and the palpebral edema, are very often the forerunners of an acute explosive inflammatory attack elsewhere in the body. When this occurs, the eye lesion, which has been exceedingly obstinate in resisting treatment, promptly gets well.

CONJUNCTIVITIS: The inflammation of the conjunctiva in these lithemic patients is always bilateral, and is characterized by marked injection of the conjunctival vessels, by a feeling of intense heat and smarting in the eye and eyelids, by lachrimation and photophobia. Both the ocular and palpebral conjunctiva are involved, but there is no secretion of any kind other than the excessive flow of tears. It resembles closely the electrical conjunctivitis so often met with in persons who are working all day under the electric light.

The usual local applications of cold bathing, weak solutions of cocain, and the milder astringent salts, such as alum or zinc sulphate, give no relief. On the contrary, the usual astringent applications intensify the subjective symptoms. The attack lasts a varying length of time, usually less than a week, and is followed by an explosive inflammatory attack of arthritis in the toes, ankles or wrist-joints. Then the congestion of the conjunctival vessels subsides rather suddenly, the burning sensation disappears, and in the course of forty-eight hours all the ocular symptoms have vanished.

EDEMA OF THE EYELIDS: Another rare ocular complication of general lithemia is a diffuse edema of the eyelids. This usually involves all four eyelids, but is most marked in the upper lids. It is a diffuse infiltration of the skin and subcutaneous cellular tissue, and does not involve the conjunctiva,

either of the lids or eyeball. The lids are sometimes quite hard and tense, and cause a distinct disagreeable pressure on the eyeball. Several times I have suspected the existence of chronic nephritis, but repeated examinations of the urine proved negative. In the course of a few days, the symptoms of an acute arthritis will develop, and then the palpebral edema, which was not relieved by the usual local applications, rather promptly disappeared, and at the end of a week from the appearance of the arthritis no trace of the swelling remained.

CHORIOIDITIS, RETINITIS AND OPTIC NEURITIS: The deeper lesions of the eyeball occurring in the course of general lithemia, involving as they do the retina, chorioid and optic nerve, are of graver importance, and leave lasting traces behind them in impaired vision, enfeebled function, and a tendency to development of cataract, or progressive atrophy of the optic nerve.

In this class of cases we come face to face with the degenerated arteries and veins so common in advanced lithemia. The hemorrhages met with in these cases indicate the gradual hypertrophy and degeneration of the entire vascular system. Any considerable change in the intra-ocular tension, whether increased or diminished, may give rise to hemorrhages in the retina or chorioid or even in the vitreous humor. Where there are as yet no hemorrhages, the retinal arteries may be seen to pulsate, not only on the optic disk, but in the retina, far beyond its margin.

In this condition of general lithemia, we meet with hemorrhages, venous obstructions and irregularities of the terminal circulation, due to great arterial pressure and a relaxed condition of the vascular walls.

These hemorrhages may occur in one or both eyes, and are of sudden onset. They may be single or multiple, and when there are many they may be scattered all over the fundus, and may be of all shapes and sizes. The high blood-pressure in the arteries, later accompanied by diminished power of resistance in the walls of the vessels due to faulty metabolism, naturally lead to these blood extravasations. This arterial degeneration, beginning as arterio-fibrosis, and ending as arterio-sclerosis, is hereditary in certain families, and in some of my own cases the signs of arterio-sclerosis were often the first

symptoms of the hereditary malady.

A similar condition is met with in the veins, and, in fact, this phlebo-sclerosis may precede the arterio-sclerosis. Both these conditions are found much more frequently in the eyes of those who suffer from chronic atypical gout, than in the typical inflammatory form of the disease. One of the results of this phlebo-sclerosis in the retinal veins is edema of the retina, which is one of the constant symptoms of the early stages of the disease. If the circulation becomes re-established through the obstructed vessels, this edema disappears, but if the obstruction to the blood current becomes permanent the distant branches become dilated and varicose. The hemorrhages, which are of venous origin, are due probably to the rupture of these minute varicose dilatations.

In cases of atypical gout, the diagnosis as to the relation of cause and effect is not always easy. The inflammatory process in the retina may be so marked that relatively large deposits appear in the retina and chorioid. The changes seen with the ophthalmoscope are a sero-plastic inflammation, with the deposit of irregular patches of yellowish exudation, marked venous hyperemia, narrow arteries, numerous small hemorrhages, and recurrent vitreous hemorrhages. It would seem as if these recurring retinal and vitreous hemorrhages were almost pathognomonic of general lithemia. The retinitis is of a localized character, confined to the posterior zone of the fundus, and is usually associated with an optic neuritis.

The subjective symptoms consist in defective vision, at first for reading, but later for objects at any distance, and a certain degree of photophobia, most marked for artificial light. The *objective* symptoms, besides the retinal edema and hyperemia, the patches of exudation and the hemorrhages, are a blurring of the outline of the optic disk, resembling that seen in the first stage of papillitis. The retinal arteries are diminished in caliber, the lumen being sometimes reduced to the merest thread. The white lines along the vessels are broad and distinct, and can be traced well towards the periphery of the fundus. In addition, the retinal veins often show fusiform dilatations like small aneurysms. The patches of exudation are entirely within the inner layers of the retina. The hemorrhages are linear or flame-shaped, and may be found all over

the fundus. If vitreous opacities are present, they are either the result of previous hemorrhages, or an evidence of co-existing choroiditis.

These fundus changes are generally bilateral, though rarely symmetrical. The degenerative changes in the walls of the blood-vessels are at first very minute, and as they begin in the intima, are often overlooked. The general angio-sclerosis and the exudative patches in the retina cause marked impairment of central vision, but the disease never ends in blindness. The loss of central vision is always progressive up to a certain point, and no improvement can be expected from any method of treatment.

The hemorrhages occur in the early stages of the disease. When the walls of the vessels become thickened by the deposits, they lose their elasticity, but become stronger, and then hemorrhages are less likely to occur.

Microscopic examination of these retinæ confirms the existence of the extensive angio-sclerosis. While all three coats of the arteries are thickened, the main increase is in the intima, and the lumen is often obliterated. The proliferation in the adventitia is largely granular, while the thickening in the intima is mainly due to hyaline deposit. The nerve fibers on the papilla and in the retina are varicose, and in the retina the spaces between them are filled by masses of fine granular matter. This granular deposit is also found in all the layers of the retina except the bacillar layer. Sections of the optic nerve as far back as the chiasm show the same changes in the walls of the vessels, and the same varicosity of the nerve fibers. The blood vessels of the chorioid also show the same changes of angio-sclerosis.

From the microscopical standpoint, the most significant finding is this angio-sclerosis. In endeavoring to explain the results of these vascular changes as we see them first with the ophthalmoscope, we have to consider three factors, viz: the shortening of the tunica media, the compensatory endarteritis, and the atrophy of the muscular coat.

A permanent slowing of the blood-current in an artery is followed by a narrowing of its caliber, which is brought about on the one hand by a contraction of the tunica media, and on the other hand by a deposit of exudation in the tunica intima.

Any retardation of the blood current in the retinal vessels, which is not at once entirely neutralized by a corresponding contraction of the media, leads to a hyperemia of the vasa vasorum, and to a new growth of tissue in the intima, which narrows the lumen of the vessel, and does away more or less completely with the normal rapidity of the current.

Occasionally we meet with one of these gouty patients who presents the same subjective symptoms as the others, but when we come to make a careful examination, the ophthalmoscope gives almost a negative result. While the angio-sclerotic changes may be found in the retina, there is no patchy exudation, and there are no hemorrhages, and no opacities in the vitreous. These are cases of retro-bulbar neuritis without involvement of the retina. Here the marked objective symptom consists in the presence of a central or paracentral scotoma in the field, or of irregular peripheral contraction of the field, according as the central or peripheral bundles of nerve fibers in the optic nerve are more affected by the inflammatory process. The same process exists here in the nerve back of the eyeball, as is found in those cases in which retina and optic nerve have simultaneously been involved. Judging by clinical experience, these cases pursue the same slow course as the others, and normal vision is never restored, while the prognosis as to the maintenance of the existing vision is more unfavorable than in those cases in which the retina is the chief seat of lesion.

CHORIOIDITIS: A still rarer ocular lesion in gouty patients is chorioiditis, either alone or later associated with retinitis. The condition is usually bilateral, though it has been known to occur in one eye alone. If seen in the later stages, it is difficult to distinguish from the chorioiditis associated with constitutional syphilis, as the retina has become involved, and we have the ophthalmoscopic picture of chorio-retinitis.

But in the early stage the retina is not involved, though the lesion is in the chorio-capillaris, which is the finest vascular network in the body, and the vessels are arranged in superimposed layers, which diminish in size from without inwards. The velocity of the blood current in the vessels being inversely proportional to the diameter of their lumen, in these very small vessels the blood current is very slow. In gouty pa-

tients, the blood is charged with an excess of uric acid, and is in contact with the delicate structure of these minute vessels much longer than in the larger vessels. If it be true that uric acid in the blood causes contraction of the arterioles, it must interfere with interstitial circulation and induce pathological changes in these tissues. Patches of yellowish-red exudation appear in various places in the chorioid, and if of any decided prominence the retinal vessels crossing them are displaced. After awhile the patches atrophy, the hexagonal pigment cell layer between retina and chorioid gradually disappears, the stroma of the chorioid becomes visible, and the atrophied patches are surrounded by a black pigment zone. Eventually the chorioidal stroma also undergoes atrophy, and the white sclerotic is left. The fundus between the patches may be entirely normal. When the chorioidal stroma becomes visible, the vessels usually show signs of partial or complete obliteration. The outer layers of the retina over these patches become more or less infiltrated with pigment, and the atrophic process involving the retina, more or less impairment of vision results.

A still rarer ocular lesion in chronic lithemia is a *paralysis of one or more of the external ocular muscles*. This appears without warning, and the first intimation that the patient has, is an attack of diplopia, the double images varying in relative position according to the muscle involved. The muscle most frequently affected is the internal rectus, although I have seen a paralysis of the external rectus, and of the superior rectus as well. I have never seen a case in which the paralysis was bilateral. The paralysis may be partial or complete. It may be visible to the naked eye, or may only be discovered after careful tests have been made with candle and prismatic glasses. The paralysis of the muscle is as a rule transient, and, like the conjunctivitis or the edema of the eyelids, is often a precursor or warning of an explosive inflammatory attack of gout elsewhere. As soon as the latter occurs, the muscular lesion gradually disappears without any special treatment.

Treatment: The treatment will vary with the age of the patient, the nature of the lesion, and the severity of the type. It has to do primarily with the habits of life, more or less modified, by the patient's condition and environment, but is

also largely dietetic, while the administration of drugs is relegated to second place in its importance.

The first question that the thoughtful physician asks himself is, what is the remedy for this "suicidal pace" of modern life? The natural answer to this is the absolute necessity of a more quiet life, together with great moderation in eating and drinking. It is known that a meat diet raises the blood pressure; hence, we should curtail the amount of meat eaten. We should insist upon systematic exercise, because it increases oxidation, improves the capillary circulation, and thus assists the process of elimination.

As alcohol dilates the peripheral vessels and does not increase the blood pressure to any appreciable extent, its use in moderation need not be interdicted, especially in patients long addicted to its use, but when taken it should be largely diluted.

Tobacco should not be permitted, because it contracts the blood vessels and raises the blood-pressure.

Water should be freely used to aid elimination.

A free natural movement of the bowels should be daily established, preferably by the phosphate of soda or the benzoate of soda.

Whatever the origin of the products which induce hypertension, they bring about the toxic effects only while they are circulating in the blood. We have good grounds for believing that the uric acid group are eliminated mainly through the kidneys, and our best renal eliminants are the salts of lithia, soda and potash.

Sodium nitrate may be used as a vaso-dilator, to reduce the high blood-pressure. In giving this drug, it is well to combine it with a reliable heart tonic like caffein or strophanthus, and of the two I prefer the latter.

It is a good rule to examine the heart and general circulation very carefully before prescribing any of the so-called cardiac drugs. A rapid, irregular or intermittent pulse, a very rapid pulse rhythm, or a mitral systolic bruit, would seem to point to cardiac inadequacy in the presence of high blood pressure, and would serve as indications for cardiac stimulation in conjunction with vaso-dilatation. It does not necessarily follow that because the blood pressure is high, we must administer drugs to relax this tension, for in many of the cases

cardiac tonics are needed. Moreover, experience teaches us that a high blood pressure does not necessarily indicate the need of the prompt administration of drugs, for Nature often comes to our aid and maintains cardiac integrity in spite of the circulatory resistance, and the very urgent symptoms gradually yield without the use of pressure-reducing drugs.

The blood-pressure may be reduced for a time by the active vaso-dilators, like the nitrates, and the administration of such drugs may be necessary to meet sudden emergencies. But a permanent reduction of excessive blood-pressure by these drugs indicates, unfortunately, the presence of a weak heart. If the blood pressure be over 200 mm. of mercury, the vaso-dilator should be slowly administered, and its effects on the blood pressure, the pulse rate and sensations of the patient should be carefully watched. The effect produced by these drugs cannot be accurately measured by the record of the blood-pressure. The patient's subjective sensations and the pulse rate afford a better means of judging of the effect produced. The administration at once of a full dose of such drugs may cause serious consequences on the patient's heart and nervous system. Caution should be our watchword in the use of all the vaso-dilator drugs.

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PAPILLOMA OF THE CARUNCLE, WITH REPORT OF A CASE.*

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The eye has been the object of the investigations of so many brilliant minds for so many years, that the unexplored avenues of research are few and far between. Occasionally, the anatomist reports some deviation from the normal in the structure of the eye or its appendages, or it may be that the histologist or pathologist has something new to describe concerning its normal or diseased tissues. More frequently the bacteriologist enriches science with the fruits of his labors, or the therapist announces some new remedy to combat pain and disease. But these are infrequent occurrences—milestones to mark the upward course of Ophthalmology. The majority of writers must be content to report additional cases of more or less rare ocular conditions, and to collect the literature bearing on the same for the use of others. Such is the purpose of this paper.

The *caruncula lacrimalis*, according to Wiedersheim,³⁰ is, together with the *plica semilunaris*, a remnant of the *membrana nictitans* of birds, reptiles, etc. This so-called third eyelid is a duplicature of the conjunctiva, and has no genetic connection with the skin. This, however, is directly contradicted by Ask,² who says, in substance, that in the course of its development, the lower canaliculus detaches a portion of the epithelial tissue from the margin of the lid. This contains some glandular anlagen and encloses some mesenchyme. The whole is gradually displaced nasally, by the development of the lower lid, until it lies in the inner canthus, where it becomes the anlage of the caruncle.

The anatomy of the caruncle is deemed of so little importance, or so little is known concerning it, that nothing at all is

*Read before the Ophthalmic Section of the St. Louis Medical Society of Missouri, April 10, 1907.

said about it in the smaller text-books, and even the larger ones have only a paragraph or two of general description. For example, Fuchs¹¹ says: "The caruncle is histologically a small island made of skin, containing sebaceous and sweat glands, and having its surface covered with delicate light-colored hairs." This agrees with the description of development given by Ask (loc. cit.).

As to the function of the caruncle, there is the greatest possible dearth of information. Only one author, Vagliasindi,¹² has any suggestion to make. His theory is that the caruncle and the plica semilunaris by their position prevent the too rapid outflow of the tears from the conjunctival sac.

Passing to the diseases of the caruncle, the same unsatisfactory state is found as that which characterized the information concerning its anatomy and physiology. Usually, the brief statement is made that the caruncle may participate in the diseases of the conjunctiva. Sometimes the additional remark is found, that the caruncle may be the sole seat of a disease, to which the name *encanthis* is given. This is qualified by the statement that this term is employed in designating tumors arising from the caruncle. To quote again from Fuchs¹³: "The caruncle participates in the inflammations of the conjunctiva. New formations are designated by the old term *encanthis*, *encanthis maligna*, or *encanthis benigna*, such as simple polypoid or papillary outgrowths of the caruncle."

In looking up the literature on papilloma of the caruncle, the first reference work to be consulted was the Catalogue of the Surgeon General's Library, published in 1886.¹⁴ Of the cases of tumors of the caruncle indexed there, one was simply tumor of the caruncle, one was fibroma, one was dermoid, one hypertrophy of the caruncle, two were cancers, and one was a connective tissue tumor (probably sarcoma). There was no reference to papilloma. In the edition of 1904,¹⁵ there were indexed one adenoma, four melanotic tumors, two angeosarcomata, one sarcoma, and one papilloma, the latter being reported by Roselli.¹⁶ In the Index Medicus,¹⁷ there is a reference to a case reported by Veasy.¹⁸ In his article, the author describes his own case, and refers to six additional cases from an article by Posey and Shumway.¹⁹ Of these, one was a case of their own, the others having been reported as follows: One

by Hirschberg and Birnbacher," one by Weeks," one by Parasotti," and two by Testellin." The diagnosis in all cases was confirmed by microscopic examination. In Nagel's Jahresbericht," extending from 1870 to 1903, only one case is indexed, viz., that of Terrien," which is reported also in the Ophthalmic Year Book for 1904." This case returned twice in twelve years. Berl⁴ refers to four cases of papilloma of the caruncle, one case being reported by each of the following: Secondi," Roselli," Kubli," and Franke." The case of Roselli is undoubtedly the same as the one referred to above, though the reference is to a different article.

To these twelve cases should probably be added another one, described by Desmarres⁵ under the head of *encanthis fongeux*. The tumor was not examined microscopically, however, so no definite conclusion can be drawn.

The text books are even more barren of reports of cases. Arlt⁶ makes no mention of papilloma of the caruncle. Ball⁷ merely states that it has been described. Norris and Oliver in their small text-book⁸ do not refer to it, nor do Theobald⁹ or De Schweinitz.⁷ Fuchs has already been quoted. Access was not possible to the part of the new Graefe-Saemisch containing diseases of the caruncle. Greeff,¹² in speaking of tumors of the conjunctiva, says: "Am häufigsten gehen sie von der Gegend der Carunkel aus, doch finden sie sich auch auf der Plica semilunaris und der Conjunctiva bulbi," i. e., he says they usually arise from the region of the caruncle, but he does not say that they come from the caruncle itself. He reports a few cases of papilloma of the conjunctiva, but none of the caruncle itself.

This comprises the literature reviewed. While it is not as complete as it might be, the different reference works so overlap that it is hardly possible that a case has escaped. Of course cases have been reported as papilloma of the conjunctiva, which may have involved the caruncle also, but they lie outside the scope of the present paper.

The net result of the examination of the literature, therefore, has been the finding of twelve positive cases, viz., one each reported by Veasey, Posey and Shumway, Secondi, Roselli, Kubli, Franke, Hirschberg and Birnbacher, Weeks, and Parasotti, and two reported by Testellin. Furthermore, there

is the doubtful case of Desmarres. To these the author adds the following case:

MRS. G. H. R., age 27, presented herself on Feb. 5th, 1907, complaining of an unpleasant sensation in the left eye, described by her as a "feeling that there was something in it," which she had noticed for about two weeks. It was most pronounced in the inner corner of the eye, and had caused her to pick at it without experiencing any relief.

Family History: Patient stated that her maternal grandfather and great-grandfather had each become blind in the left eye—cause unknown—and that the left eye of her mother had become smaller, and was losing sight without any apparent cause. The patient qualified the word smaller by explaining that the eye seemed to be receding into the head. Naturally she was the more alarmed on her own account.

Examination of the left conjunctival sac showed that it was slightly more hyperemic than that of the other side. No foreign body in it, or on the cornea. The media were all clear, and the fundus was normal. This was especially carefully examined on account of the unfavorable family history. The vision was 6/6 for distance; 0.37 on the test card for near vision.

In the inner canthus of the left eye there is seen a small red mass, about the size of a radish seed, which springs from the caruncle, and projects forward between the lids. A probe can be passed around it on all sides except posteriorly, where it is attached by a broad base to the whole of the caruncle (Fig. 1). It is freely movable, except at the base. With a lens, the surface is seen to be uneven. When the eye is closed, the mass still projects through the palpebral fissure, but disappears when the eye is tightly closed.

A tumor of the caruncle, probably papilloma, was diagnosed, and the patient was advised to have it removed, to which she consented. Under cocain anesthesia, the mass was grasped with a pair of forceps, pulled forward and outward, and cut away from the caruncle by means of a small pair of curved scissors. The base was then carefully and minutely cauterized with an electro-cautery point, just below red heat. This is a very important part of the treatment, for unless all vestiges of the growth are destroyed the tumor will return. After the

PAPILLOMA OF THE CARUNCLE.



Fig. 1. Papilloma of the Caruncle (Dr. Loeb).



Fig. 2. Papilloma of the Caruncle (Dr. Loeb).

cauterization, a little 10% boric acid ointment was placed over the caruncle, and the eye was tied up. On the following day, the caruncle was red and somewhat larger than that of the other side. On the second day it was still slightly red, and about the same size as that of the right side. On the third day, both caruncles were pale and of equal size. Since then she has reported several times for examination. The condition remains the same. The last time I saw her was March 25th, 1907.

The mass removed was placed in formol, embedded in paraffin, and the sections were stained with hematoxylin-eosin, Van Giesen and Mallory's stains. Even macroscopically, fine projections could be seen springing from the main mass, suggesting papilloma.

Microscopically the tumor consists of a central stock of connective tissue and blood-vessels covered with stratified squamous epithelium. The most superficial epithelium is thrown into numerous projections (Fig. 2). separated from each other by more or less deep grooves. Each papilla consists of several layers of stratified squamous epithelium clothing a central area of connective tissue and capillaries, which can be traced as continuations of the stock of the main mass. One of the papillæ has been torn away in preparing the section, and can be seen at some distance from the main mass of the tumor. Its place is occupied by epithelial and connective tissue remnants. These findings confirm the tentative clinical diagnosis of papilloma of the caruncle.

It is still too early to give a prognosis as to the recurrence of the tumor, but two months have passed since the operation, and there are no signs of irritation of the eye or reinvolvement of the caruncle. The case is reported merely as one of a very rare condition, and not on account of any special features connected with the case itself.

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THE REAL CAUSE OF MYOPIA.

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A review, from any standpoint, of the literature of the Anomalies of Vision and Refraction, will in all probability convince you that so far the work in this line has been done from too narrow and contracted view-points.

Some authors have examined the eyes of large numbers of people, especially children, with the chart, or with the ophthalmoscope, or more recently with the retinoscope, for the sole purpose of determining the percentage of the defective ones. Until recently attention was mainly paid to myopia, of which it was soon discovered that it generally commences about the age of ten and rapidly increases until maturity, when it, as a rule, comes to a standstill.

Hermann Cohn, in his "Hygiene of the Eye," compiled enormous statistics which show that in Germany in the higher-grade schools for boys—the so-called Gymnasiums—there were 42.5 per cent of myopia, while in those for girls there were only 17 per cent. In the middle schools for boys there were 30 per cent of myopes, and in those for girls 10 per cent. In the common schools in cities there were only 7 per cent of myopes, and in villages only 1 per cent.

From these facts the conclusion was drawn that long-continued studying in poorly lighted schoolrooms was the cause of myopia. Great efforts were made to obtain better light and better seating facilities for the children. Their futility, however, was soon demonstrated by Just, of Zittau, Germany, who found in the best lighted and furnished school houses the same percentage of myopes as in the old dark ones. In this country, Risley, of Philadelphia, found the same, and while both agreed in the facts, they differed, however, very much in the explanation. Just simply shifted the responsibility from the schoolrooms upon the rooms in which the children attend to their home-study, and Risley, following the here prevailing opinion that hyperopic astigmatism is the cause of all evil, charged it with causing myopia.

In Germany, the children in the higher-grade schools always were and are yet—although in a lesser degree—overburdened with work. In 1890, the Emperor appointed a special Board of Teachers for the purpose of remedying this evil. Before them he delivered an address in which he described the condition of affairs as he found it in the Gymnasium of Kassel, in which he was educated. The boys had to work more than twelve hours a day, and in one room, 18 out of 21 wore glasses.

Quite a number of theories of the origin of myopia have been advanced. All of them, however, deal only with the mechanical side of the process. No one ever seems to have thought that the general health of the child might act a part.

The scientific foundation of the doctrine of *Vision and Refraction* has been laid in 1862 by Donders's "*Essay on the Nature and Consequences of Anomalies and Refraction.*"

Before Donders's day, only four affections of the eye were known in which the vision is impaired without any inflammatory or other visible changes, namely: hyperopia, presbyopia, amblyopia, and asthenopia. Myopia means the capability of seeing only close by; within the horizon of a mouse—nearsightedness. Presbyopia means an affection of the vision caused by age, which allows the patient to see only far off, but no more close by—farsightedness. Amblyopia means dullness of the vision without apparent cause. Asthenopia means vision without strength, inability to use the eyes for any length of time without fatigue.

By their common language, these four, not truly optical, but medical terms indicate their great age; they were transmitted from the most remote ages of antiquity. The first strictly optical term was the word "astigmatismus," which was devised early in the last century by Whewell. Donders added three more, namely: emmetropia, ametropia, and hypermetropia. The latter affection had been observed by several others shortly before him; by placing it into opposition to myopia, however, and by establishing between both the emmetropia as zero-point, Donders became the father of modern optics. Besides, he was the first to scientifically separate the refraction from the vision, and to gauge both.

Donders's emmetropic eye is an eye in which parallel rays of light are focused exactly on the retina, and starting from such an eye as the zero-point, he called, as we do with temperature on the thermometer, one side, the hypermetropia, plus, and the other, the myopia, minus; using the diopter as the unit of degree.

For the vision, he introduced an entirely different gauge. Prompted by the same practical impulse which caused Fahrenheit to make the lowest temperature which ever came under his observation, zero-point of his thermometer, he took what he considered as the best vision practically occurring in the human eye as the starting-point of his scale of vision. He did so because in both directions from the zero-point of his scale of refraction, the visual acuity decreases. With admirable acumen he expressed the best or full vision with the unit-mark in the form of a fraction whose numerator and denominator have the same value. The numerator indicates the distance of the object from the eye, as, for instance, 20 feet; and if the object has the required size and can yet be distinctly seen, the number 20 is also used as denominator. $V-20/20$ is equal to $V-1$ and indicates that the eye has full vision.

Donders measured the images on the retina by their subtending angle at the nodal point of the eye, and required an eye with full vision to see letters under an angle of five minutes. He knew well that some eyes can see under a smaller angle; for practical reasons, however, he accepted the angle of five minutes as standard. Time does not permit to enter more deeply into this subject; suffice it to say that according to Donders, a normal eye should have $R-0$ and $V-20/20$. In ametropia the distant vision decreases, and can be improved with lenses; in myopia, with minus, and in hypermetropia with plus lenses.

Donders first observed that in hypermetropia there is a difference between young and old persons, in so far as the older ones instantly accept the fully correcting glass, while the younger ones refuse to do this. Therefore, he made a distinction between manifest and latent hypermetropia. In the latter case, he said, the hypermetropia is suppressed by "an inherent exertion of accommodation which is controlled by habit and cannot be arbitrarily nullified. Paralysis of accom-

modation with atropin renders the latent hypermetropia manifest. It may in this way rise from zero to four and a half diopters, and even to six. In emmetropia and in myopia, paralysis of accommodation causes the refraction to barely diminish one-half of a diopter."

Donders failed to consider the tonus of the muscles and its variations in health and disease, and therefore he could give no explanation for that "inherent exertion of accommodation." Neither did any one of his followers think of the tonus, and in their minds that "exertion" soon became a pathological symptom, a *spasm of accommodation*.

Donders charged hypermetropia with causing two pathological conditions with which it is frequently associated. Let us here consider only what he says about the latter.

"Asthenopia manifests itself as a fatigue-symptom. The eye is not apparently diseased and not painful. Visual acuity and the ocular movements are both normal. Distant vision is perfect, but reading, writing, etc., cause a sensation of tension over the eyes. Objects become indistinct. Rest relieves."

"Asthenopia has been sought for in the retina and in the organs of accommodation, and has been ascribed to external conditions and undue efforts of the eyes. I have shown that asthenopia is not an accommodative anomaly, but one of refraction, namely, a definite degree of hypermetropia."

Asthenopia a definite degree of hypermetropia! In this stupendous mistake Donders was yet confirmed when he discovered that asthenopia can be relieved by the use of convex lenses.

The momentum of Donders's accomplishments was so great that with them also his mistakes were accepted as true without any investigation. He and his friend Helmholtz impressed the mathematical principle, especially in Germany, to such an extent upon the minds of their followers, that when reading German text-books on refraction, as, for instance, Graefe-Saemisch's *Handbuch der Augenheilkunde*, one does not feel as though reading a book written for the purpose of diagnosing and curing diseases. One feels as if the eye were not of flesh and blood; not of soft tissues, at best of cartilaginous consistency, and streamed through with blood. One feels as if it were cut with the finest machinery from the hardest glass,

and as if its changes were following mathematical formulas of a complexity which places them entirely beyond the comprehension of an ordinary physician.

Donders's charges against hypermetropia were taken up especially in this country; and the discovery that the trouble caused by it can be remedied with glasses gave the manufacture and the sale of spectacles a great impetus. Probably following Donders's words, "undue efforts of the eyes," an attempt was made at replacing the time-honored scientific term "asthenopia" by the non-scientific term "eyestrain." The theory was advanced that hypermetropia would naturally produce eyestrain, and the latter would by some kind of reflex-action produce all kinds of diseases, especially nervous disorders, and that all these could right away be cured with properly adjusted spectacles and with these only. Some hardly credible cures have been reported by Geo. M. Gould and others, especially by Ranney in his work, "*Eyestrain in Health and Disease*." Even some quite young children were fitted with glasses, and, for instance, Black of Milwaukee claims that he saw some eighteen-months-old babies who cried when their glasses were removed and became quiet and took the breast again as soon as their glasses were placed back on their noses.

The word eyestrain, the use of which should be discouraged, has come into pretty general use in this country, but not in England; other countries are safe from it, because it cannot be translated into foreign languages. Any attempt at doing this exposes the senselessness of the word. Still, for shallow thinkers it has a certain practical meaning; it reminds me of Goethe's famous sentence, "Where comprehension fails, a timely word prevails."

The best description of asthenopia is given by Hartridge of London, England. He says: "Asthenopia frequently accompanies hypermetropia, myopia, and astigmatism. It is also met with *where no ametropia exists*, and may then be caused by over-fatigue or diminished power of the ciliary muscle, weakness of the internal recti, or exhaustion of an over-sensitive retina. It shows itself by inability to sustain long and continuous near work, and is accompanied with more or less pain in the eyes themselves, or around the orbits." Still, however strikingly these words refute Donders's theory of the depend-

ence of asthenopia upon hypermetropia, they furnish nothing in its place, and leave the question of its origin and nature simply open.

Therefore, I decided upon finding a solution of my own of this puzzle by looking at it, not from an optical and mathematical, but from a purely medical standpoint, as the ancients did. For this purpose I made it during the last fifteen years, a special object to test and record, besides patients, also healthy persons, especially children, with remarks about their general health, and with their addresses, so that it became possible to re-examine them from time to time and compare the results. My lists comprise more than 5,000 individuals, and many of these have been kept under observation for over ten years. Permit me to present to you in a nutshell some of the results of my work.

Donders's standard of the normal eye having refraction (R) 0 and vision (V) 20/20 is too low. Presbyopic people excepted, R-0 already indicates myopia. V. should be at least 20/15; about 4 per cent of the people of Montana have 20/10. The normal condition in a healthy man is R+1.00 and V. 20/15.

If young persons have R.+1.00 and V. only 20/20, this indicates asthenopia, and on close examination some slight disturbance of the general health will nearly always be found. In asthenopia the distant vision of the non-myopic eye is always impaired; most, of course, in hypermetropia, but even in the normal eye with R.+1.00 it sinks to 20/20, 20/25, or less, and can be restored to 20/15 by medical treatment alone, without glasses. It is far from me to dispute the usefulness of glasses under these circumstances; my desire is only to emphasize that they do not effect the cure. They assist in obtaining it, without, however, being the essential means and indispensable.

The combination of V-20/20 with R-0 seems not to occur in young people. As soon as the refraction sinks below 1, the distant vision rapidly decreases, and at the zero-point it is 20/50, 20/60, or still less; this already constitutes myopia. In the aged this is different; here we often see R-0 together with V-20/20 and presbyopia. The latter, however, need not necessarily appear. For instance, I know a lady of sixty-five with

white hair, rosy cheeks, and a full set of teeth; a picture of health. She has R.+1.00, V. 20/20, and reads fine print without glasses. On the other hand, there are dyspeptic and anemic people, below forty years of age, with R.+1.00, V. 20/20, and premature presbyopia. Also presbyopia is a symptom of failing health, and there is no sharp line between it and the asthenopia of the young. In fact, presbyopia is asthenopia of the aged. It frequently occurs that seemingly healthy elderly men present all the symptoms of the so-called eyestrain who cannot be lastingly benefited by the most exactly adjusted spectacles. They reject day after tomorrow what they accept to-day, until they finally discover that they need no glasses at all. Slight disturbances of the health are here at the bottom. It also happens not rarely that elderly men after their return from an outing in the mountains where they exercised all day their distant vision, discover that their reading glasses, which they had left at home, and which had given satisfaction for years, are now too strong, and that they want now weaker lenses. After indoor life during the winter I have seen them resume the stronger lenses without ever having had any symptoms of eyestrain.

Thus, we see asthenopia, myopia and presbyopia connected by a mysterious tie from some kind of an abnormal condition of the general health. Analytically proceeding for the solution of this puzzle, we have to commence with some facts in the physiology of the muscular and nervous systems which are strangely overlooked by the writers on vision and refraction.

Two of the most important functions of these two systems are the tonus of the muscles and the co-ordination of their contractions. No muscle, even when at perfect rest, is absolutely relaxed; as long as its life lasts it is constantly in a condition of slight contraction. This can be seen, for instance, at the fingers, which are slightly bent during life and hang straight down in the corpse.

The tonus is subject to considerable variations; a strong and healthy man has more tonus in his muscles than a feeble man. Also non-striated muscles have their tonus, and that of the ciliary muscle has caused Donders to speak of "latent hypermetropia," and others to think that in hypermetropia the ciliary muscle is in a condition of spasmodic contraction. It

was impossible for me to determine who first used the term "spasm of accommodation," which, in spite of numerous protests, came into such general use. Donders, in 1862, did not use it, and as early as 1884 Hirschberg said that he hardly believed in the existence of the acute, and not at all in that of the chronic spasm of accommodation. In the many thousands of eyes which he examined in the upright image and with glasses, he never found a single case of it. Neither did Hess on examination of over 5,000 school children. My experience is fully in accordance with this.

Nevertheless, there is a difference in the refraction before and after the instillation of atropin. Donders first observed this, as above stated. His observations were, as always, correct; with the explanation, however, this is different. Atropin does not operate alone by paralyzing the ciliary muscle; if this were the case, the pupil would, under its influence, show only a medium degree of dilatation like that from paralysis of the third cranial nerve. Atropin operates by stimulating the radiating fibers of the iris, which then in a not yet fully accounted for way, act antagonistically to the ciliary muscle. Atropin does to the ciliary muscle what we do to the flexor muscles of the forearm when we straighten our fingers by contracting the extensor muscles. As soon as these relax, the hand reassumes its slight flexion.

It is difficult to determine the exact length of a muscle. During life the tonus varies in health and disease and with it the length of the muscle. After death it is first shortened by the rigor mortis and after this its physical condition changes, so that it can, like dough, be stretched to almost any length. This also applies to the ciliary muscle, and should be taken into consideration when the refraction is tested. It has become customary to take what we find under mydriasis for the exact refraction of the eye; the propriety of this, however, is very doubtful. In my opinion, the true refraction is what we find with the ophthalmoscope without mydriasis, and it has no stable value, but is subject to variations in health and disease through alterations of the tonus of the ciliary muscle and changes of the blood-pressure. The greatest stability is found in presbyopia, and especially in myopes, where there is atrophy of the ciliary muscle and an increased rigidity of the eyeball

The medical term "tonus" is one of the many old Greek words which physicians have used for thousands of years with a certain indistinct meaning, but without even an attempt at explaining its nature. Only recently comprehension dawns. Since Brown-Séguard discovered the inner secretion, we know that no organ has only that function for which it is known, but each one also acts a part in the general metabolism. Thus, the muscles do not only perform labor, but, in the birds and mammalia, they also produce heat, and they do this not only while they work, but also while at rest. For the proper performance of their functions, the muscles depend upon certain other organs by which they are supplied, as it were, with fuel. And the final products of the metabolism of the muscles do not go directly to waste, but other organs look for them as food. There exist some very complicated relations between the local metabolism of the different organs, the final products of some being food for others. If one organ is by disease prevented from furnishing its proper products, other distant organs will suffer and finally the general metabolism will be disturbed. Instead of the normal products of local metabolism, sometimes even substances will enter into the circulation which are injurious to other organs, or even to the whole system; this constitutes auto-intoxication.

The aim of organotherapy is to repair deficiencies in the internal secretion of diseased organs by the introduction into the system of extracts made from healthy organs of the same kind. This young science has already made such progress that, instead of crude extracts, active principles are used in the shape of chemically pure crystallized salts. Here the lead is taken by the spermin, an oxidation-promoting katalysator, upon the presence of which all processes of life depend, as Poehl and Tarchanoff have in such an able manner explained in their "Rational Organotherapy," of which I have made an English translation.

When the local metabolism and the inner secretion of the different organs, and especially the production of spermin, is in perfect order, perfect health prevails, and shows itself most strikingly in the strength and the tonus of the muscles. The stronger the muscles, the higher the vitality of the organism and the greater the tonus. In the eyes, the tonus of the ciliary

muscle shows itself in the correction of hypermetropia. The latter is not acquired like myopia; it is congenital, and seems to remain unchanged up to old age, when it sometimes decreases. Lower degrees of it are the normal refraction, and during perfect health it is corrected in part by the tonus, and the remainder by automatic contraction of the ciliary muscle in co-ordination with the striated eye-muscles, as we shall see below.

The tonus is independent of the central nervous system, but the latter governs besides the contractions, also the co-ordination of the muscles. When we practice complicated movements, we do not only exercise the muscles; we also exercise the nervous centers which preside over the co-ordination of the single muscles concerned in the movements. During the practice, some muscle-actions which at first were purposely and consciously performed, become involuntary and automatic. At first every single muscle is contracted by a special order from the nervous center; later on, the combined action is instituted as a total without attention to the single muscles; this saves labor to the nervous center. When the co-operation is disturbed the effects of the practicing are lost and the single movements must again be voluntarily performed, and with the same difficulty as in the beginning. These "undue efforts" will soon cause fatigue and pain.

Upon the eyes of men fourteen muscles co-operate, seven in each eye, six of which are striated, and one—the ciliary muscle—non-striated. The twelve striated muscles direct the axes of the eyes so that they meet at the object of our attention. The two ciliary muscles give the eyes the proper focus for the images on the retina.

These fourteen eye-muscles are united by the closest co-ordination possible. There can never be a single eye-muscle alone contracted; not even can be moved one eye alone. Always all the muscles concerned in a certain co-ordinated action, and always those of both eyes together are simultaneously contracted. This shows that there is one center in the brain presiding over all the eye muscles from which both eyes simultaneously receive co-ordinated orders. The recognition of this fact exposes the fallacy of the doctrine of the corresponding retinal points, the so-called *horopter*, of which Savage says in

his *Ophthalmic Myology*: "The supreme law of binocular vision is the law of corresponding retinal points. * * * It is so well known and so universally accepted as true, that it hardly needs more than a mere mention."

As though it were yesterday, instead of nearly forty years ago, Helmholtz stands before me, when he in his lectures on *Physiological Optics* exposed the fallacy of the horopter. Finally he declared that in reality it does not exist; that nearly always we see singly from not corresponding retinal points, that we, however, should nevertheless let the horopter stand, because it gives the only explanation for the fact that we see singly, while we have two eyes. Instantly it aroused my curiosity why no person asked the question why we hear only singly, while we have two ears. It seems to me that, if we had a thousand eyes, we could see only singly, and if we had a thousand ears, we could hear only singly, as long as we have only one center of consciousness. Diplopia occurs only under certain pathological conditions by which the center of consciousness is deceived.

The center of consciousness presides directly or indirectly over all the other nervous centers; its disconnection constitutes sleep. During sleep the subordinate centers operate automatically, but otherwise in the same way as during waking. All the functions of the different organs continue during sleep; only the amount of their work is reduced to such an extent that time is gained for the removal of certain products of retrogressive metamorphosis of albumen, which by their accumulation cause the fatigue. The removal is accomplished by the oxidizing influence of the spermin.

The muscles are during sleep by no means reduced to the zero-point of their contraction. The tonus continues and is even frequently increased, and if the sleep is disturbed, by dreams or otherwise, even some partly voluntary movements are made without awakening and after them some muscles may remain in a condition of so-called katatonic contraction..

This applies especially to the muscles of the eyes. Not even during the normal sleep of a healthy person stand the eyes in a position of perfect relaxation of their muscles with parallel axes, as in the corpse, but they are turned inwards and upwards with convergent axes from katatonic contraction of cer-

tain muscles. And if the sleep is disturbed by some indisposition, and if then, in an imperfectly darkened sleeping-room, the attention of the eyes is attracted by a small illuminated object, especially if this be visible only to one eye, the eyes may be held fixed in the most abnormal positions. If the eyes were freely movable in their sockets, this could do no harm. As, however, they are in one place firmly attached by the optic nerve, such distortions, if lasting for hours and recurring nightly, may, by pressing here and pulling there, permanently alter the shape of the eyeball, especially in children whose sclero-corneal sac is softer and more flexible than that of grown people. Therefore, it suggested itself to me to replace the improperly lighted schoolroom, which has been vindicated by Just, Risley, and others, by the imperfectly darkened sleeping-room as a cause of the development of myopia.

Still, there is one link missing; namely, the cause of the indisposition which must be either lasting or often recurring, to have a permanent effect on the eye. This missing link unveiled itself in scrophulosis, and its *modus operandi* in auto-intoxication. It created a strange impression in me to see Hermann Cohn in his "*Hygiene of the Eye*" deal with scrophulosis only a couple of hundred pages before myopia, describing both as juvenile diseases which generally die out about the age of maturity, and still not bringing them into any connection. No wonder that youngsters when they work every day indoors more than twelve hours, become scrophulous and finally tuberculous; the myopia, however, which they develop does in my opinion not originate in the room where they study, but in that room where, overtired as they are, they fail to find sound sleep and stare in a dazed condition with distorted eyes at some illuminated crack at the side of the window-shade.

The nature of the auto-intoxication became clear to me by the study of Poehl's Spermin Theory. It seems to be generally assumed that auto-intoxication is caused by reabsorption of septic material from the bowels. Poehl, however, has demonstrated that it is not produced in this way, but by retention in the organism of products of imperfect oxidation. Poisoning with anything that has been introduced into the organism, cannot be called *auto-intoxication*. This word means poisoning with substances which have been *produced by the organ-*

ism itself through alteration of the metabolism. The metabolism depends upon processes of retrogressive metamorphosis of albuminous substances by oxidation which is conducted by the spermin and can take place only in its presence. Retardation of these processes causes an accumulation of products of imperfect oxidation, some of which are poisonous. Auto-intoxication is chemically identical with fatigue, and in the highest degree with exhaustion. Putrefaction depends upon processes of retrogressive metamorphosis of albumen by reduction; it is conducted by bacteria and can take place only in their presence. Metabolism and putrefaction are chemically diametrically opposite, and their products have opposite electromagnetic qualities; the former have positive and the latter negative chemotactic force.

In the blood, spermin is formed by disintegration of leucocytes. The latter are attracted from their abodes in the bone-marrow and other places by the positive chemotactic force of the blood. Variations of the latter produce hyperleukocytosis or hypoleukocytosis, respectively, and thereby an abundance or a deficiency of red blood-corpuscles and spermin. These two are the oxygen-carriers of the organism, and upon their quantity depends the energy of the whole metabolism, the so-called vitality. Hyperleukocytosis produces increased strength and tonus of the muscles, also of the nervous system and all the other organs of the body—high vitality. Hypoleukocytosis does the opposite.

As you can find exposed in my article, "*Vitality and Immunity*," in enlarged lymphatic glands, substances with negative chemotactic force are formed, against which the organism is not protected by a layer of epithelium, as in the bowels. When reabsorbed into the blood, these substances are liable to produce the following series of symptoms: Hypoleukocytosis—*anemia*—deficiency of spermin—auto-intoxication—*atony* and weakness of the muscles which soon show fatigue—*neurasthenia*—*asthenopia*—disturbance of the co-ordination of the eye-muscles—imperfect sleep and katatonic contractions of eye-muscles during the same—*myopia* and other anomalies of vision and refraction, also *strabismus*.

My records contain the names of five children whom I tested and recorded before they had, and who later on developed

myopia, the progress of which I had occasion to observe for quite a number of years. Not one of these ever had hyperopic astigmatism. They all had, when I saw them the first time, R. +1.00 and V. 20/20. None of them, however, had perfect health. All were marked as having enlarged cervical glands and tonsils, slight anemia and constipation. Three had measles not very long before.

Scrophulosis is one of the most dangerous and at the same time least suspected diseases. The dangers lurking in it are underrated, because the disease is so common and has so great a tendency towards self-cure. Still, in my article, "*The Pathology of Tuberculosis*," you can find some strong evidence in favor of the opinion that scrophulosis is the mother of tuberculosis, and in the same way I believe it is also the mother of myopia.

A CASE OF ALEXIA IN A BOY OF FIFTEEN.

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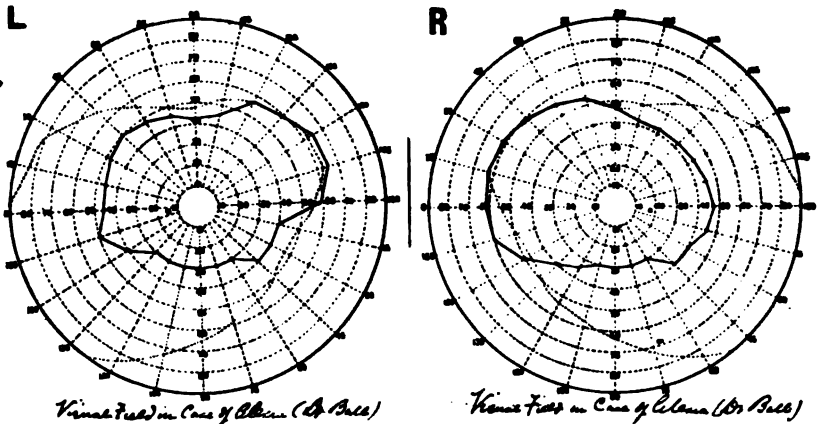
G. H., aged fifteen, was referred to me by his school teacher with the statement that the lad was unable to read or spell with any ability, and was therefore kept back in room (grade) six with children much younger. The boy is well developed tall, and of intelligent appearance. Family history fails to show the presence of syphilis, tuberculosis, insanity or nervous diseases. The boy has always been in good health with the single exception that at the age of six he had eight epileptiform convulsions which disappeared in a short time under treatment. These "fits" never caused complete unconsciousness and apparently came without previous traumatism. Ever since his entrance in school at the age of six, he has been unable to read as other children. He must spell out each word of more than one syllable; the separate letters he pronounces readily, and short common words he reads with ease. He can write from dictation, but has trouble in copying. Numbers are not so difficult. He has a good ear for music, is an excellent mechanic, and is bright in studies that do not depend upon reading.

Examination—Vision equals 6/5 in each eye, test letters readily pronounced. Under atropin vision equals 6/7 in each eye, brought up to normal by a half-diopter spherical convex lens. Muscles of the eyes are efficient. Fundus oculi is normal in each eye. Perimeter shows marked symmetrical contraction especially of the inferior portion of field. Colors are recognized easily, and are normal as to distribution. The knee jerks and gait are normal. The urine contains neither albumen nor sugar. Lungs and heart are normal.

This then is a case of alexia or word-blindness of a number of years' standing. The epileptiform convulsions occurred before his entrance into school, and it is impossible to say whether they caused the alexia, or whether it was present earlier. The development of that particular portion of the brain that controls the reading of words must occur after the

acquisition of speech, and so possibly there never was any proper formation of the word-sight. The perimetric charts indicate some atrophy of the optic radiations, but the ophthalmoscope fails to show any abnormality in the nerve head itself.

His teacher has been advised to push him along the line of least resistance. Training in mathematics, manual and technical training, music and drawing will be carried on. The efforts of the past nine years to teach him to read and spell have for the most part been useless.



He reads today, at the age of fifteen, as a child of seven; his pride has been insulted daily, and he has become disgusted with all schooling because he has been kept in association at school with children of a much younger age, and has been made to appear stupid, when in reality he is very bright. Because of this, he has shunned the company of boys of his age, and has been very much alone. No doubt many more such word-blind children would be discovered if a careful search were to be instituted among backward school children.

A CASE OF AMAUROTIC FAMILY IDIOCY.*

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S. H., male age fifteen months, was referred to me by Dr. Helen Kirshbaum, who has had him under her care since birth. His parents are Hebrews, the mother being a Hungarian, and the father of Russian origin. The labor was normal, and the child weighed eleven pounds at birth. He was a "blue" baby and remained so for days, and later his lips and finger-tips showed poor circulation, and even now the left leg is darker than its fellow. The father, who had always had asthma, died of pneumonia after a three days' illness, several months before the patient's birth. The mother was prostrated; for fully a month was in despair, and could not be aroused to take any interest in life. Her health had always been good, and so far as the immediate families of both parents are concerned there is no evidence of tuberculosis, syphilis or insanity. The patient is the youngest of six children, two of whom are dead. The oldest was run over, and the fourth died of typhoid fever at two years and ten months.

The mother says that this baby did not notice things at three months, like her other children, and at six months he could not sit in the high-chair like his brothers and sisters. He has never been able to stand alone, nor has he ever noticed playthings. The child is breast-fed. The mother says he does not seem able to swallow table food, or even to take milk from a spoon without choking.

The patient looks fairly well nourished but is very pale. All his muscles are flaccid and he lies inert in his mother's lap. He cries lustily at times, and at others seems to breathe as if there was a laryngeal obstruction.

Dr. Walter Freeman, who examined the patient at Dr. Kirshbaum's request, says it is probably a case of hypertrophy of the folds—just beneath the true cords, a not uncommon condition; or possibly a papilloma of the commissure below

* Read before the Section on Ophthalmology, College of Physicians, Philadelphia, March 19, 1907.

the level of the cords, this being more uncommon. He thinks tracheotomy will have to be considered and that soon.

Ocular Conditions: Eyes are slightly divergent, child is unable to fix, but seems to be able to move the eyes in all directions. The pupils are equal, three mm. in diameter and slightly responsive to light. The corneae are clear as well as the other media, the disks are white and sharply defined, and the vessels are reduced in size, particularly the arteries. At the macula is the typical cherry red spot horizontally oval,



Amaurotic Idiot (Dr. Buchanan).

scurrounded by a white areola, dense toward the center and fading away toward the periphery. It is about $1\frac{1}{2}$ D.D. wide, and slightly oval.

This curious disease is no longer rare, as Falkenheim collected sixty-four cases in 1901, and Heveroch in 1904 eighty-six cases, forty-four of which occurred in America, and they are still coming, so that it is not expedient to give a dissertation on the subject, but a brief resume may not be amiss.

In 1881 Waren Tay described the ocular condition presenting symmetrical changes at the yellow spot in an infant, associated with bodily weakness and inability to hold up its head or move its limbs. Later the same ophthalmoscopic picture was seen by others. In 1887 B. Sachs presented the post-mortem findings of a patient suffering from a form of idiocy associated with blindness, without knowing of Tay's cases.

Kingdon calls attention to the fact that the fundus condition reported by the oculists was a symptom of the rare disease that Sachs described.

Sachs gives the principal symptoms as follows:

1. Mental impairment during the first months of life, and leading to absolute idiocy.
2. A paresis or paralysis of the greater part of the body, either flaccid or spastic.
3. The reflexes may be either normal, deficient or increased.
4. The diminution of vision terminating in absolute blindness. (The cherry red spot in the region of the macula lutea, and later optic atrophy.)
5. Marasmus, and a fatal termination as a rule before the age of two years.
6. The occurrence of the affection in several members of the same family.

The *etiology* has never been satisfactorily explained. The disease is almost confined to the Jewish race, only six cases having been reported in Christians. Syphilis has been generally positively excluded. Sachs at first contended it was an arrested development, while Kingdon, Hirsch and Jacobi believed it to be a degenerative change. Hirsch thought it might be the result of a toxemia, and advocated artificial feeding in these families, but several of Sachs's patients were fed by strange wet nurses. Sachs now believes that the disease is a result of a congenital defect; that the nervous system of such a child can perform life's functions up until five or six months

of age, and then, unable to meet the strain, an active degeneration sets in, which is the natural result of an arrested development. In other words, Sachs accepts Gowers's term of abiotrophy, or essential failure of vitality, and thinks that is present as an inherited condition in these cases.

Drs. Poynton, Parsons and Gordon Holmes after an exhaustive study, clinical and pathological, of three cases, concluded that it is not due to arrested development, nor to bacterial toxins, but that it is due to some inherent biochemical property of the protoplasm of the cells as a result of which they undergo certain changes which cause a degeneration of the parts of the neurone, the normal existence of which is dependent upon them.

Why this "biochemical property" is confined to the protoplasm of the cells of little Hebrews no one has yet discovered.

Pathology: Dr. B. Sachs was the first to note the general character of the disease in 1887; the brain cortex showed abnormalities associated with inferior development. All the sections cut from various portions of the cortex showed alteration and degeneration of the pyramidal cells. Hirsch, a decade later, pointed out that not only the cortex, but also the cells of the gray matter of the entire central nervous system were affected.

Very few eyes have been examined microscopically. Tréacher Collins examined the eyes in Kingdon's case, and reported that the choroid was healthy, but that the retina had been thrown up in a fold around the macula. It showed a spacing of the outer reticular layer which he thought was indicative of edema. These folds always produce such spaces even in healthy eyes.

Dr. Ward Holden, in 1898, who made a pathological report on the eyes of Dr. Hirsch's patient, was the first to show the relationship between the fundus condition and the general nervous affection. By securing the eyes four hours after death, before post-mortem changes had begun, and by hardening one eye in 10 per cent. formol, he obtained a specimen in which the retina stayed in position at the macula. To avoid error he also prepared the eyes of an infant dead of the same disease (pneumonia) in exactly the same way.

In the normal eye the ganglion cells vary from 10 to 30 microns in diameter. In the periphery, where the cells are scattered, large cells abound; but in the macular region, where the ganglion layer is several cells deep, the cells are small, irregularly pear-shaped, and packed closely together.

Sections of the diseased eye in this case showed the average size of the ganglion cell to be increased, and the average shape to be altered toward the globular. In Nissl preparations of the formol eye, with a one-eighteenth immersion, the cell membrane and cell reticulum could be made out, but no Nissl granules were present, and the cell body had the appearance of having had its liquid contents withdrawn. No actual edema of the retina was found. The other layers were apparently normal. The ciliary nerves were normal and the ganglion cells of the ciliary body did not give these reactions. The optic nerve showed an absence of myelin in many fibers, and the neuroglia tissue was increased—simple degeneration.

Comparisons with the preparations of the brains of the patients of Drs. Sachs and Hirsch show the staining reactions in the cerebral and retinal cells in each case to be identical.

The changes in the fundus are explained by the changes in the ganglion cells. In the fovea the ganglion cells are absent. At the margins of the fovea the ganglion layer is six to ten cells deep. One disk's diameter from the fovea horizontally it is three to four cells deep; two disk's diameters two to three cells deep, till at the periphery it is a scattered layer of single cells. Hence we have the red center destitute of the cells, with the chorioid showing through, next the dense white, corresponding to the deepest portion of the layer, fading away gradually as the cells become fewer. In the vertical meridian the ganglion-cell layer thins out more rapidly than in the horizontal.

The optic nerve atrophy Dr. Holden regards as both an ascending and a descending degeneration; a breaking down of the neuraxons of the affected retinal ganglion cells, and of the ganglion cells of the basal ganglia.

The ocular neurons have undergone a primary alteration like the cerebral neurons, both being embryologically related, developed as they are from the same medullary tube of the involutioned ectoderm.

The eyes in the case reported by Dr. McKee and the writer were examined by Dr. Shumway, and the findings were identical with those of Ward Holden. There was no edema at the macula, and in our case the degenerative process had advanced so far that it was often difficult to find the ganglion cells at all.

In the cases referred to above, reported by Poynton, Parsons and Holmes, the eyes were examined from two cases. In first case, one eye was examined macroscopically, and a minute hole was found in the macula which they thought probably explained the red spot, however, the fellow eye showed the retina to be complete. In the latter, post-mortem changes complicated the minute histology. There were folds in the retina which they regarded as partly due to pathological processes; they found some edema at the macula, and though admitting that it might be post-mortem, they thought there was a probability of edema during life. The ganglion cells showed no diminution as to numbers, but individual cells showed profound changes. The cells were swollen and rounded, the nuclei eccentrically situated, there were often vacuoles in the cytoplasm, and Nissl granules were absent.

They conclude that "amaurotic idiocy is a primary disease of the nervous elements, that it is a primary cell disease, and the alterations in the nerve fibers are secondary; that the primary change is disease of the interfibrillar protoplasm, and that the alterations in the neuro-fibrils are secondary."

Falkenheim says two facts speak against edema as the explanation of the fundus picture; first, the unchanged appearance for months; and, second, the absence of veiling of the finer vessels of the macula; so that Ward Holden's explanation is probably correct.

The progress of the pathological process may be judged by the macula picture; the eye ground is normal at birth; at about three months, a haze appears at the macula; and the picture is typical at six months.

As to treatment, nothing has been found beneficial. Sachs reports that all his efforts to prevent disease by careful nursing and feeding have been fruitless. Kingdon has advised the use of thymus extract, but has not gained anything by it. Prophylaxis by prevention of conception in these families is not justifiable, because healthy children have been born to the same parents.

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TWO FATAL CASES OF ORBITAL CELLULITIS.*

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The orbit is susceptible to a great variety of diseases common to other parts of the body, and to others, which, by reason of its formation and its close relation to the fossæ of the face and skull, are peculiar to it. The sources of the diseases may be from without, as, for example, traumatism, or they may be the inflammations of contiguous structures, or they may be metastatic. A comparison of the orbits of different races of men, of men of the same race, and in the same individual at different ages, will show decided variations in conformation. The contents, however, in all are practically identical, the principal difference consisting in the relative amount of fat and connective tissue. It has not been shown that the excess of fat and the relatively diminished connective tissue, or vice versa, predispose to inflammation, but it seems reasonable that in the former, once the seed of inflammation has been planted that its development and extension would be more rapid and destructive. From the character of the orbital contents, and from their great vascularity, the well-known observation that inflammations here are as a rule acute and rapidly progressive may be readily accepted. The most violent and the most rapidly fatal cases within my experience are the following:

CASE I. (Figs. 1 and 2.) A four-months-old child of Italian parentage was admitted to the Jefferson Hospital Feb. 15, 1907. The mother stated that two days before admission the right eye commenced to protrude and the lids were red and swollen. On the following day the eye was still more prominent, and on the third day, when I examined him, the eye was decidedly exophthalmic and immovable, the lids tense, reddened and fixed, the conjunctiva bloodless and thickened, and the cornea partly denuded of its epithelium. The diagnosis of orbital cellulitis was made, and three incisions into the orbit, the

*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, March 19, 1907.

blade of the knife reaching as far as the apex, failed to show the presence of pus. The temperature was 103°. Two days later the cornea and conjunctiva were slightly necrotic, the eye still more prominent, the temperature about the same, and the right arm, from elbow to shoulder, was erysipelatous, the inflammation being most marked over the elbow joint. The eye was enucleated, and a specimen of blood, as it gushed from the severed vessels, taken for bacteriologic examination. Contrary to expectation, no pus was found at this time in the orbit, but during the remaining few days of life there was an



Fig. 1. On Admission (Dr. Hansell).

abundant thin, purulent discharge. The blood removed at the time of operation contained streptococci and diplococci. The erysipelas advanced onto the back, the temperature climbed to 105, 2-5°, pneumonia developed, and on the fourth day after operation the patient died.

The etiology and diagnosis of this case are obscure. The affection commenced apparently as an orbital cellulitis, advanced into a widespread erysipelas, and terminated in pneumonia. The clinical and bacteriological manifestations were

those of septicemia, but the child was healthy with the exception of an eczema of the scalp, and well developed, took his proper amount of nourishment from its natural source before and during its sickness, and had no history of traumatism or infection. The cavities accessory to the orbit were examined by Dr. D. Braden Kyle and were reported to be healthy. From the expulsion of small plugs of mucous from the nostrils while the child was crying, I was led to believe that the source of the infection of the orbital tissues was purulent disease of the ethmoid cells and possible necrosis of the orbital plate of the ethmoid bone, but examination of the orbital cavity after



Fig. 2. Two Days After Admission (Dr. Hansell).

enucleation of the eye revealed nothing abnormal in the orbital bones. The explanation of the morbid process is probably that the child became infected by the streptococcus from an unknown source, and that the infection showed itself first in the orbit, two days later in the arm, spreading to the trunk and finally giving rise to a septic fatal pneumonia.

CASE II. H. B., thirteen years old, was struck on the right eye by an icy snowball, Feb. 14, 1907. Two days later he applied to the Out-Patient Eye Department, complaining of severe pain in the eye and partial loss of sight. Dr. J. C. Knipe, acting chief of clinic, who examined him, made the following report: On the day following the blow he attended to his usual duties and seemed to be as well as usual. To-day he has edema of the right lids, and the eye is opened with difficulty. The swelling extends over the glabella above, and over the malar bone below; marked chemosis of conjunctiva; ball protrudes so that the lids barely cover the cornea. Eyeball apparently intact. Further examination prevented on account of retching and projectile vomiting. Within the last hour he has had mental hebitude, fainting spells, and has been unable to walk without assistance. During the attack of unconsciousness he had twitching of the facial muscles and spasmodic movements of the hand and fingers of the right side, particularly of the index finger. He was admitted to the Hospital and put to bed. During the afternoon the eye became more prominent and mild delirium alternated with semi-unconsciousness. At 8 o'clock the lids were stretched to their utmost by the protruding eye, which was fixed in the straight forward position, the media clear, the pupil dilated, and the entire retina and nerve markedly edematous. After consultation with Dr. J. Chalmers DaCosta, the boy was etherized, and Dr. DaCosta operated by making a semilunar skin and muscle flap over the anterior temple region, dissected the skin over the superior orbital margin, and opened the orbit from above. A moderate amount of pus was discharged through the opening. Believing that the antetrior lobe of the cerebrum was involved, he trephined the parietal bone and carefully opened the dura. Through the minute opening, cerebrospinal fluid, and a small amount of pus were discharged. The wound was drained with iodoform gauze and dressed. The temperature, which was 103° on admission, continued high until the patient died two days after operation and four days after the injury. During the operation no fracture of the orbital walls was found and no post-mortem was allowed. It was impossible to say from the symptoms whether the purulent orbital cellulitis preceded the purulent meningitis, or the reverse. Both were extremely rapid in their development, and

it is probable that they appeared simultaneously. The unusual features in this case are the nature of the injury, the sudden onset of the purulent disease, and the rapidly fatal termination.

Subjective or idiopathic orbital cellulitis may be due to one of many causes. Bull (Norris and Oliver System) gives the causes in the order of their frequency, as follows: Exposure, periostitis, exanthematous fevers, meningitis, erysipelas, diseased teeth, suppuration in the cells of the ethmoid and sphenoid bones, metastasis, panophthalmitis, purulent lacrimal disease. Beard (Ill. M. J. VIII, 1905) adds septic disease of the skin over contiguous areas, or of that area drained by the ophthalmic vein, purulent inflammation of the middle ear, and parotitis. Weiss (Zeit. f. Augenh. 3, 1903) gives a full report of the post-mortem examination of two fatal cases, both due to infection from disease of the nasal mucous membrane. Nettleship describes (St. Thomas' Hosp. Rep., Vol. 3) a number of cases due to diphtheria and other contagious diseases. Herpergens (Ann. d'Oculist., Oct., 1905) reports three cases in influenza, of which two died. B. K. Chance (Am. Med., June 13, 1903) records two fatal cases, in each of which the orbital cellulitis was a sequel of scarlatina.

Whatever may be the cause, the symptoms are nearly uniform and constant, and no difficulty usually presents itself in the diagnosis. The swelling and discoloration of the lids, which are stretched tense by the rapidly protruding eye, the chemosis of the conjunctiva, a portion of which is driven forward in a sac-like swelling anterior to the level of the commissure, the limitation of movement or complete fixation of the ball, the thickening and necrosis of the conjunctiva and cornea uncovered by the lids, the loss of vision from edema and hemorrhages in the retina and optic nerve, the absence of bruit, the suddenness of onset, and the rapid culmination of the disease, point unmistakably to its real nature. In the chronic or subacute cases the diagnosis may remain for a time uncertain. Such a case was Sattler's. (Trans. Amer. Oph. Soc., 1900.) He was undecided between orbital cellulitis and malignant disease until gentle manipulation over a swelling over the frontal sinus caused a disappearance of the

tumor by forcing its contents through the ethmoid cells into the nostril.

The treatment should consist in giving exit to the pathologic contents of the orbit at the earliest moment through deep incisions around the ball, and draining by iodoform gauze through the opening thus made; irrigating the orbit with antiseptic solutions; hot fomentations; general supporting remedies and removal of the exciting cause. In the violent acute and erysipelalous cases, like those described in this paper, treatment seems to be of no avail.

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PROLIFERATIVE UVEITIS.*

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It is not my purpose to examine critically into the merits of either argument in the interesting discussion provoked by the paper of Fuchs in which he described histological findings considered by him as characteristic of exciting inflammation, but merely to point out the nature of these changes, and wherein the views of Fuchs and of Ruge differ, and also to describe the anatomical conditions present in two eyes removed by the writer for undoubted sympathetic inflammation. Fuchs states that of 181 eyes removed because of sympathetic inflammation or for fear of it, 24 showed proliferative uveitis, and that in all but one of these, reference to the clinical histories revealed sympathetic inflammation, and that in this single exception the clinical diagnosis had been sympathetic irritation.

The microscopic examination showed giant cells in 50%, and round cells and epithelioid cells in all of the cases. He holds it characteristic of the chorioiditis in the exciting eye that the infiltration with lymphocytes, epithelioid and eventually giant cells, becomes denser towards the posterior pole of the eyeball. The infiltrate occurs first in the outer layers, the capillary layer may long remain normal, the lamina vitrea remains intact even when, as the result of the proliferation of the endothelial cells and the immigration of lymphocytes, typical foci are found on its inner surface. Usually the chorioid is the most affected portion of the tract. In many cases the surface of the iris and of the ciliary body were found free from exudate, as however surface exudate is found with considerable certainty in endophthalmitis septica, it must be considered as a condition of this affection, and when present together with the process which he looks upon as denoting an exciting inflammation, the infection must be considered of a

*Read before the American Ophthalmological Society, Washington, May 8, 1907.

mixed type. He holds that in pure exciting inflammation there is no plastic inflammation present. The infiltrate consists of lymphocytes, epithelioid, and at times giant cells. He states that of the ten sympathetic eyes so far studied anatomically, six showed little or no plastic adhesions, and only two showed marked plastic inflammation.

Ruge agrees with Fuchs that of the three types of cells, round, epithelioid and giant, the latter are found in one-half of all exciting eyes, and that in the vast majority of cases when epithelioid cells are found, giant cells are present. He thinks too, that the non-discovery of epithelioid cells does not necessarily imply that they are not present, and therefore that the inflammation is not of the exciting type, as they might be present though hidden by the round cells. He has found individual giant cells in three cases, and in various other cases he has demonstrated transitional forms of epithelioid cells to connective tissue cells in a simple traumatic fibrinoplastic inflammation.

Ruge does not consider either the grade or the location of the chorioidal inflammation as pathognomonic, as he has found in exciting inflammation, the chorioid in some cases intensely, and in other cases not at all involved. He therefore agrees with other authors when they assert that "frequently anteriorly, and adjacent to the ciliary body the chorioid is found strongly infiltrated, while posteriorly it is quite free."

Ruge further asserts that literature shows in 25% of sympathetically inflamed eyes, the presence of a superficial plastic inflammation, and he holds that this does not harmonize with Fuch's view that, when in sympathetic inflammation the iris and ciliary body are bathed in exudate, there is present a mixed infection, in as much as Fuchs entertains the view generally held that the anatomical changes in the sympathising eye must be, in a sense, the prototype of the typical findings in the exciting eye, as in the secondly inflamed eye, complications arising from mixed infections are excluded.

The writer has arranged in the following table the contrasting points upon which, according to Fuchs, the differential diagnosis rests.

Endophthalmitis (Traumatic Fibrino-plastic Inflammation).

1. Location of the inflammation, in the superficial layers of the ciliary body, pars ciliaris retinae and more posteriorly the retina itself. The underlying chorioid involved only when the retina does not afford sufficient protection, and then only in the anterior and posterior zones.

2. Exudate is upon the surface of the iris, ciliary body and retina.

3. Exudate consists of fibrin and leucocytes, the latter composed of polynuclear and mononuclear types, the latter prevailing in proportion to the acuteness of the process.

4. Tendency for the infiltrate to travel outwards and perforate the sclera.

Exciting Inflammation.

1. Location of the inflammation in the stroma of the uvea; the pars ciliaris retinae and the retina itself often free. The anterior portion of the chorioid is the least affected part of this membrane.

2. Exudate confined to the stroma of the affected membranes.

3. Exudate consists of lymphocytes and the products of the fixed tissue cells, epithelioid and giant cells.

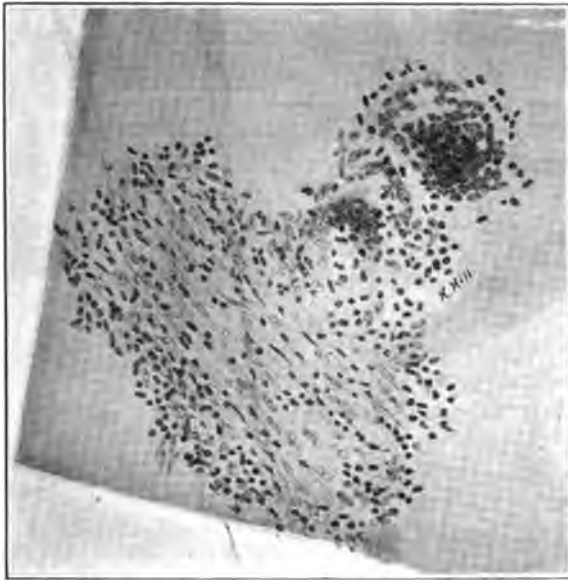
4. No such tendency aside from the local destruction of the sclera by pus in panophthalmitis.

The author's cases are as follows:

CASE I. The clinical history was that of a mild purulent panophthalmitis subsequent to an operation for the extraction of a cataract, followed by sympathetic inflammation resulting in blindness. The case is reported in full in the Journal A. M. A., 1905. Dr. E. A. Shumway described the microscopical findings as follows:

The cornea is almost entirely replaced by connective tissue, which contains many blood vessels and much round cell infiltration. The surface epithelium is thickened and irregular, sending inshoots of cells into the tissue beneath, and in places is absent over a considerable area. There has been a perforation at the center, and Descemet's membrane is curled up back of the cornea. There is no trace of the lens except the capsule, which is imbedded in a thick mass of organizing exudate, which presses up against the posterior surface of the cornea. The iris and ciliary bodies are entirely destroyed and can be recognized only by the clumped masses of pigment with which the cellular mass is infiltrated which fills up the interior of the eyeball, and which is being converted into organized tissue. To some extent this mass is composed of pus cells. These are particularly prominent on one side in the neighborhood of the ciliary body, and from here a purulent collection surrounds

and infiltrates the processes. Elsewhere and in the position of the chorioid, the inflammation has more of a plastic character, the cells being mononuclear in type; with them are many endothelial cells, and in certain localities, especially in the posterior half of the eyeball, a great many giant cells. (Fig. 1.). In the tissue there is *no evidence of caseation*, and hence the process is not to be considered tubercular. These giant cells have been long known and well described, especially by Krause, Axenfeld, Schirmer and others. The cellular mass representing the chorioid is separated from the sclera, as the result of



the shrinking of the tissue in the interior of the eyeball, and the space thus left is filled with a moderately cellular exudate which is also being organized, and contains numerous fine capillaries. The retina is almost completely destroyed, only traces of it remaining. The vitreous is occupied also by an exudate which contains comparatively few cells but a large amount of fresh blood. It shows also well advanced organization, fine connective tissue processes running in every direction, accompanying newly formed capillaries. The older blood vessels throughout the eyeball show marked changes; their walls

are thickened, the cells of the intima are proliferated, and many of the vessels in the chorioid are completely obliterated. The ciliary nerves in the thickened sclera are surrounded by dense mantles of round cells, but outside of the sclera they do not show the condition to as marked degree. The optic nerve is moderately infiltrated, but the chief excess of cells is in the intervaginal space, especially at their blind extremities within the sclera. Here there is a pronounced proliferation of the endothelial cells, and also many infiltrating round cells.

The examination therefore, shows that the contents of the eyeball has been destroyed by a purulent inflammation (panophthalmitis), which has evidently spread from the anterior segment, from the perforated cornea, and has been succeeded by a plastic form of inflammation, with the production of many giant cells, and the proliferation of the endothelial cells of the tissue. This tissue is now going on to the formation of connective tissue, which is causing shrinking and distortion of the eyeball.

There is a moderate neuritis, but a more marked perineuritis, and an infiltration of the ciliary nerves.

CASE II. G. M., aged 25 years; brakeman; came to Wills Hospital, Nov. 3, 1906. On the previous day, while gunning, he had received a charge of shot in his right eye. There was a single perforating shot wound of the ciliary region to the nasal side into which the iris had prolapsed. The vitreous was filled with blood. The eye was blind. The radiograph showed that the shot had not remained in the eye. A fatal prognosis was given and the patient was advised to have the eye enucleated. On the day before Thanksgiving Day he was allowed a pass until the following Monday, but as there was a suspicious haze of the edge of the disk, he was ordered to report daily for examination by the Internes. This he failed to do and upon returning, five days later, vision in this eye was found reduced to 5/35. The pericorneal zone was injected, there was a fine precipitate upon the membrane of Descemet, and a marked neuroretinitis with peri-papillary edema. He was at once given a sub-conjunctival injection of the bichloride of mercury (1-5000) and the blind injured eye was enucleated. The subsequent treatment consisted of the sub-conjunctival injections of salt solution, atropin, dionin, and inunctions of

mercury with the internal administration of salicylate of soda, Gr. xxx t. i. d. The pupil dilated ad maximum and remained so. The neuritis increased in intensity the first week, but thereafter slowly regressed although when last examined in March, was still pronounced and vision—5/10.

Unfortunately the posterior segment of the eyeball was lost. The microscopical examination of the anterior segment made by Dr. H. G. Goldberg, shows, briefly that the iris and ciliary body are thickened as the result of marked proliferation of the plasma cells and of the endothelium of the blood vessels. Many of the blood vessels are being obliterated. There are a few giant cells. There is no superficial plastic exudate. A fragment of the chorioid shows the same epithelioidal proliferation, giant cells and obliterating endarteritis.

The histological findings in this case are those designated as *Proliferative Uveitis*.

Dr. E. V. L. Brown has pointed out to me that this specimen shows, as have all of the other five which he has examined, that the first part of the ciliary body to be invaded is that just outside of the pigment epithelium, the part which he has termed the extension forward of the orbiculus ciliaris, the analogue of the stroma proper of the chorioid, and that in the preserved portion of the eyeball, there is an entire absence of plastic adhesions and fibrinous exudate upon the surface. The case constitutes a pure example of proliferative uveitis.

It is of interest to note that in the first case the inflammation in the sympathizing eye was of a pronounced plastic type corresponding to the histological findings in the exciting eye which were those viewed by Fuchs as a proliferative and infiltrative inflammation, and a coexisting plastic inflammation (a mixed infection).

In the second case the microscopical findings in that portion of the exciting eye available for examination show an entire absence of plastic adhesions and superficial fibrinous exudate. Again clinically the character of the inflammation in the sympathetically inflamed eye would seem to be a prototype of that found in the exciting eye, as the only evidence of involvement of the anterior segment of the eye was a faint precipitate upon the membrane of Descemet; the inflammation taking the form of an intense neuroretinitis.

1819 Spruce St.

RETINITIS, PROLIFERATING IN CHARACTER, IN A
DETACHED RETINA OF TRAUMATIC ORIGIN;
REPORT OF A CASE WITH PATHOLOGICAL
EXAMINATION.*

WILLIAM T. SHOEMAKER, M. D.,
AND
C. M. HOSMER, M. D.,
PHILADELPHIA.

The eyeball to be described was enucleated under the diagnosis of glioma; microscopic examination showed the clinical diagnosis to have been incorrect, and an intraocular condition present of sufficient interest in the opinion of the authors to warrant the placing of the case on record. As has been commented on many times, and as is well recognized, *pseudoglioma* as a diagnosis, although clinically convenient, is essentially negative, and therefore fails of purpose. For this reason the term should not be used, when possible to determine actual conditions microscopically.

The case, Edith C., was referred in consultation to one of the authors (Dr. Shoemaker), April 20th, 1906, by Dr. C. C. Bullock, of Chatham, Pennsylvania. She was a well nourished girl twelve years of age, whose family history was entirely negative.

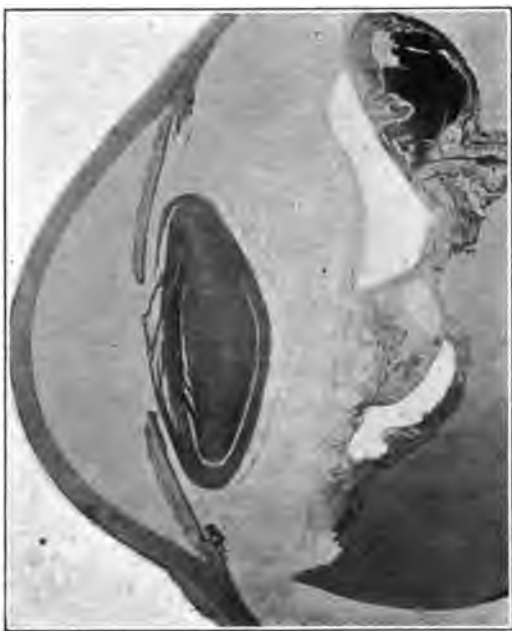
When five years old she fell, striking her left eye against the hearth. Shortly after this her mother noticed that the eyes were crossed, but gave to her observation little or no attention. About four years later, or three years prior to consultation, the pupil of the injured eye was seen to be white, following which the eye became injected. From this time, headache was complained of, and also pain in the left eye, periodic in character, and occurring about once monthly. No definite history of the usual illnesses of childhood could be obtained.

April 20th, 1906, the left eye was blind. It apparently had within it a large gray or white growth, seen upon casual inspection, and well demonstrable under focal illumination. The

* Read before the American Ophthalmological Society, Washington, May 8, 1907.

mass, or supposed tumor, was far forward in the vitreous, its surface being but a few mm. behind the lens. It seemed to spring mostly from the nasal side of the eyeball, was soft looking, somewhat nodular and without movement.

Under full mydriasis, the ophthalmoscope showed a vertical fissure or division far to the nasal side, in and beyond which red fundus and small vessels could be seen with +10 D. S. Vessels could also be seen far to the temporal periphery, showing apparently through overlying tissue. The palpebral and bulbar conjunctiva, and the entire anterior segment of the eye-



Proliferating Retinitis in a Detached Retina. Pseudo-Glioma.
(Drs. Shoemaker & Hosmer.)

ball were free from injection and seemed to be normal in every way. The anterior chamber, iris and pupil were as in the sound eye, the anterior chamber being of good depth and proper formation. The iris reacted consensually, but was inactive for direct stimulation. The movements of the eyeballs were full in all directions. Tension was normal.

The right eye had a vision of $5/7\frac{1}{2}$; was hyperopic 1.5 D., and showed no traces of disease whatsoever. At the time of examination, the patient was concluding an attack of whooping cough contracted two months before.

The diagnosis of glioma was made, and the eye enucleated at the Germantown Hospital the same day.

The pathological report on the eye, which was prepared and examined by Dr. C. M. Hosmer at the Laboratory of the University of Pennsylvania, is as follows: The eye was fixed in formalin. The retina was detached to the ora serrata, and pushed or drawn into folds. Lying upon the detached retina, there is a mass of more or less completely organized connective tissue. This appears as a thicker part on one side, and on the other, stretches away as a narrow band. This arrangement would give a clinical picture of a more or less complete septum, and being bulged forward by sub-retinal exudate, would readily suggest tumor. Passing over the mass, the hyaloid membrane can be traced; it is apparently pulled away from its peripheral attachment on one side, and is adherent to the thicker portion of the connective tissue mass. Lying beneath the thinner, or band-like portion of the mass, is granular blood pigment. The thicker, or major portion, has within it blood pigment and new formed vessels, and is intimately connected with the nerve fiber layer of the retina. Within the retina on this side, are recent hemorrhages and old organizing clots, and about the retinal vessels, are pigment deposits with vessel degeneration. It is believed that the thicker mass of connective tissue represents a large hemorrhage into the nerve fiber layer, with subsequent organization, and that the band extending from this was originally a subhyaloid hemorrhage, seeping from the first and undergoing similar organization. It is further believed that this process was subsequent to the complete detachment, inasmuch as the connective tissue mass does not extend into the cone of the detached retina. Within the sulci of the folded retina, are red blood corpuscle collections, and intermingled with these, granular pigment, indicating repeated hemorrhages. The sources of these can be seen to be the nerve fiber layer. Fine fibrils from the central body of connective tissue extend to the periphery, where retinal cells of the orbiculus ciliaris are elongated and drawn inward.

Posterior to the retina, is a large collection of richly albuminous exudate, which during preparation has shrunk, and is so drawn away from the chorioid. The exudate contains a few leucocytes. On one side of the eyeball, far forward, there is evidence of a chorio-retinal inflammation in the form of a minute patch. On this side, the retinal vessels show occluded lumina with swollen endothelial cells, and are packed about



Proliferating Retinitis in a Detached Retina. Pseudo-Glioma.
(Drs. Shoemaker & Hosmer.)

with pigment which is believed to be retinal. On the opposite side, the retinal vessels, especially the arteries, show signs of a low grade inflammation, large mononuclear leucocytes, with an occasional lymphocyte being seen in the perivascular spaces. This may, perhaps, be a crowding of the perivascular spaces with cells which have been taken up from the organizing clots, instead of a true inflammation.

The rod and cone layer has disappeared entirely, as would be expected when totally separated from its source of nutrition. The pigment layer has for the most part remained on the chorioid. The remaining posterior layers are permeated with the exudate above noted. The nerve fibers have in the

main degenerated. The supporting tissue of the retina in its entire thickness seems to be in excess. In places, it has an appearance as if combed forward toward the central mass of formative tissue.

The changes in the chorioid, so far as they can be studied, in a formalin fixed eye, are slight and of questionable importance. Opposite the point of choroido retinal attachment, near the ora serrata, there are many lymphocytes. The chorioid on this side is atrophic, and on the opposite side, there are evidences of retarded circulation. Large and small drusen bodies are seen on the surface of the chorioid.

The anterior portion of the eyeball, including the small remnant of vitreous, is negative save for signs of slight congestion of the iris and ciliary body, and early degenerative changes in the posterior layers of the lens cortex.

Briefly reviewed, the findings here noted constitute the following condition complex: Complete detachment of the retina in a child twelve years old; hemorrhage, formative tissue, new vessels, leucocytes, lymphocytes and excess of supporting tissue, all resulting in the formation of a solid mass in the anterior vitreous, clinically resembling a glioma. Absence of uveitis and of structural changes in the anterior segment of the eyeball. A trauma was sustained when child was five years old, and the present condition had probably been existent to the extent of being noticeable upon inspection for at least three years.

The injury must be regarded as important, and is presumed to be the primary cause of the disturbance. Whether the retinal changes are subsequent to detachment or the cause of the detachment, we are not prepared to say; but from the absence of iridocyclitis, and chorioiditis, excepting the small area near the ora serrata, which, owing to its minuteness and position need scarcely be considered, and from the practically normal condition of the remaining vitreous, we favor the view of primary detachment as being most probable. It is also likely that the process once started in a more or less limited detachment, caused further involvement and separation until the detachment became complete. In other words, the process would seem to be almost wholly limited to the retina, and might be regarded as an *endoretinitis proliferans*.

The many changes that may occur in a detached retina have been well described by Ginsberg. His own observations, as well as those of de Gama Pinto, Nordensen, Velhagen and others, are interesting, and show quite a variety of possibilities. In total detachment, one of two formations is generally assumed: A funnel-shaped, or inverted conical detachment, extending from the disk to the ora serrata, or the so-called umbrella detachment, in which the retina, collapsed and folded, proceeds like a stem from the disk, and when about opposite the ora serrata, continues on to the latter as a membrane at right angles to the stem. The latter configuration is usually preceded by, or accompanied by, iridocyclitis. Detachment seldom extends beyond the ora serrata, but occasionally the pars ciliaris retinæ is included (Velhagen).

Excessive folding of the separated retina, and massing around the disk, giving rise to a tumor like mass in this position, has been occasionally observed, and described by deGama Pinto and Velhagen. A detached retina may show inflammatory and degenerative changes, which in certain cases were present before separation, or changes of various character and intensity may occur secondarily in detachments of long standing.

The time at which these secondary changes occur is not definitely known. The rods and cones are always promptly destroyed after detachment. The nerve fiber layer and the ganglion cell layer have been found atrophic after a few weeks. Gliosis, or proliferation of the neuroglial tissue, occurs at times, and may constitute the essential alteration. Cysts are not infrequently found, and may develop from pre-existing cysts, or otherwise, as below mentioned. Also, connective tissue formation upon the inner surface is of frequent occurrence.

The retinal blood vessels always undergo marked changes in old detachments. The vessel walls are thickened, hyalin or sclerotic; the lumina are narrowed and often obliterated. Drusen bodies and blood pigment are found. Hemorrhage may occur, and may be small or large; the latter at times split the degenerated retina and form blood cysts.

Folding of the detached membrane, which is necessarily constant, may by variation give rise to a number of different microscopic conditions. The outer layers only may become

much folded and convoluted, due to relative overgrowth, and appear almost papillary, while the inner layers remain comparatively smooth. The folded surfaces in contact may become adherent in places, and in this way produce spaces and various kinds of cysts. On the other hand the entire retina, including the internal limitans, may be folded or convoluted. DeGama Pinto describes certain cases of this kind in which sections showed little or no retinal structure, but only irregularly arranged masses of small round cells. There was thus produced a marked resemblance, both macroscopically and microscopically to glioma.

DeSchweinitz and Shumway described a detached retina with dropsical degeneration of the visual cells, which exactly resembled clinically a glioma.

Of the eight or nine intraocular conditions which may be mistaken for glioma, Parson regards as the commonest type a generalized inflammation affecting the chorioid, and which is usually included under the term of "chorioiditis exudativa." This condition, he says, is wrongly regarded by some as a form of suppurative chorioiditis, but, occurring as it usually does in children, as the result of some acute infectious disease, the organisms or toxins of which are not pyogenic, it should not be included among the purulent inflammations.

Treacher Collins, on the other hand, who has had the opportunity of examining some very early cases of pseudo-glioma, thinks that this variety commences as a *retinitis*, although there can be no doubt that the later stages point rather to a primary cyclitis than to a retinitis. He describes a condition very similar to the one here reported, although not of traumatic origin, but in the latter case the condition has remained retinal for at least three years.

THE OPHTHALMIC PICTURE OF INTRAOCULAR TUMORS.*

DR. JULIUS FEJER,
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The ophthalmic diagnosis of tumors of the inner tunics of the eye is often very easy, but frequently is subjected to so many difficulties that the exact diagnosis can be made only on the grounds of probability and the concomitant conditions. I omit those cases where the tumor already has put the external coat of the eye under tension, causing secondary glaucoma, and where the eye must be enucleated at once. We then have time enough to convince ourselves of the correctness of our diagnosis by section of the eye, and our only cares are to sever the nerve deep enough, and to remove the orbital tissues locally involved, or cauterize them with the electrocautery. I will discuss only those cases in which the eye shows no external change, but either is entirely blind or has lost most of its vision, and the patient has no suspicion of the dangerous disease concealed within. If we try to tell such a patient with a little vision left that a malignant tumor is growing in his eye, and that the eye must be enucleated at once to save his life, away he goes to another physician. Many patients have lost confidence in me because I happened to be the first to make the correct diagnosis, and imparted the knowledge to them or their relatives.

Among the ophthalmic pictures of intraocular tumor is the well known one of glioma. Whoever has seen it once will never confuse it with another or forget it. The symptom known as the "amaurotic cat's eye of Beer" makes the presence of glioma retinae very probable. It is not pathognomonic, however, because pseudo-tumors, or the product of a chronic fibrinous inflammation of the chorioid or vitreous have caused a similar reflex from the fundus. The yellowish gleam of the "cat's eye," the reflex coming from deep in the bulb, can be

*Communication from the St. Margarethenspital at Budapest. Translated by Clarence Loeb, A. M., M. D., from the *Centralblatt für prakt. Augenheilkunde*, Feb. and March, 1907.

seen at a distance of some meters, especially if we sit with our backs to the window and have the child brought into the room from the side, and let the light fall into his eyes from the side. The pupil is usually wide, and through the wide portal much light enters, and as much makes its exit. The presence of the yellow reflex is by itself very suspicious, but the diagnosis of glioma should be made only after careful examination. Years ago I described the case of a five-year-old girl in whose blind eye there was the characteristic yellow reflex, while in the chorioid of the other apparently healthy eye were several yellow plaques. Several physicians made the diagnosis of bilateral glioma, and we did not enucleate the blind eye only because the parents were unwilling. Since then seven years have passed; the child is still alive and thriving, and the ophthalmic picture is unchanged. I at the time diagnosed the case as a bilateral chronic inflammation of the chorioid, which produced on the one side a fibrinous exudate, in consequence of which there was detachment of the retina and a yellow reflex. Such cases have been described, but only section and microscopic examination of the enucleated eye can give convincing proof of the true condition. It is always better to enucleate a blind eye than to leave a gliomatous focus unremoved. It is almost impossible to set up a rule for the yellow reflex, for its coloring depends on the transparency of the refracting media, the size and position of the tumor, the width of the pupil, and upon whether or not the tumor pushes the retina in front of it. If the tumor is subretinal, the color of the reflex is whitish or bluish.

Accordingly, the reflex gives no exact proof of tumor. The history is of importance, but still more so is the intraocular tension. One thing is certain when we observe a yellow reflex coming from within the eye of a child, viz., that we must first think of glioma and only later exclude the cases coming under the head of pseudo-glioma.

The yellow reflex accompanying glioma is visible without the aid of the ophthalmoscope, because the tumor involves the depths of the eye, and this makes its axis shorter, i. e., hyperopic, and we can reunite the divergent rays at a certain distance. We, therefore, need in this case no skill in the use of the ophthalmoscope, and our forebears were acquainted with

the trouble by means of the enlightening reflex. It is very fortunate that the symptom appears of itself in the earlier stages, because the little child knows nothing of blindness, and as soon as pain appears and the bulb becomes hard, the prognosis is much more unfavorable.

Sarcoma of the chorioid forms the other group of intraocular tumors. It is not less dangerous since it causes not only disintegration of the bulbus, but also metastases in the brain, and especially in the liver. If the ball, and thus the primary focus, has been removed in time, the patient may survive the operation five to ten years. The sarcoma usually arises in the chorioid, rarely in the ciliary body or iris. The pigment spots found in the iris, the so-called nevi, often are the origin of sarcomata. The sarcoma of the ciliary body also grows backwards, where the resistance is less, and very seldom gives the symptom which I observed in a fifty-year-old patient, viz., that the root of the iris is curved forward into the angle of the anterior chamber, and is more deeply pigmented on the anterior surface. Furthermore, I was able to see with the ophthalmoscope a black mass deep down in the eye. The vision was fingers at one meter.

Tumors of the chorioid can be confused with a luxated lens, especially if the eye still possesses vision, or perception of light. In such a case, we must be certain that the lens is in proper place, and that the anterior chamber is not deeper than normal. We must observe whether or not there is iridodonesis in case there is no change in the depth of the chamber. We can easily convince ourselves as to the position of the lens by means of Purkinje-Sanson's reflex, but the experiment must be carefully made with the candle in an absolutely dark room, since the poorly defined inverted image of the candle can be seen only by a very practiced eye. The upright image comes from the cornea; the small inverted one comes from the posterior surface of the lens, and shows with certainty whether or not the lens is in its proper place. The reflex of the lens is distinguished from that of the cornea by the additional fact that it moves in the opposite direction to the candle, while that of the cornea moves with the candle. It becomes less distinct, or disappears, if there is a cloudiness of the posterior layers of the lens, or if there is an opaque foreign mass back of it. I

have a very lively recollection of a case which occurred during my assistantship. It was a case of a woman in whom it was necessary to differentiate between sarcoma of the chorioid and luxated lens. One confrère had already devised a plan by which he could remove the lens, which was supposed to be luxated downwards and backwards, from the ball by means of a spoon-shaped instrument. Only the Purkinje reflex could convince him of the correct position of the lens, and that the mass imitating the shape of the lens was a sarcoma of the chorioid. Enucleation and section of the bulb confirmed the diagnosis.

I will report a very interesting and instructive case showing what can be present in the two eyes of one individual. The case was of special interest from the standpoint of differential diagnosis, and for this reason I reported it at the twelfth meeting of the Gesellschaft der Spitalsärzte (1905).

Early in November, 1905, a day laborer, 58 years old, was received into the Margarethenspital, who said that a horse had kicked his left eye eight years before. The subsequent inflammation was successfully treated in a hospital at Budapest. He had been able to work and read up to the time of admission, but his vision had decreased for two weeks so rapidly that he had to be led. Corresponding to the injury, the left zygoma was depressed, and the hyperostotic margo supraorbitalis projected. On the left side there was a high degree of enophthalmos, both on account of the above conditions, and also on account of atrophy of the retrobulbar fat. The eyeball is of normal size, and the movements are good in all directions. The tissue of the iris is atrophic, the pupil widened ad maximum, and its region enclosed a lens dislocated inwards and backwards, and cataractous in its middle layers. In the fundus above the disk is a mass of pigment of one-half the size of the disk. Perception of light good in all directions. The patient can even tell the direction of the hand movements. The bulb is entirely quiet. The right eye externally shows no change, but by focal illumination, and by looking into the eye from the nasal side, a black mass of the size and shape of a lens can be seen when the patient looks outward; this covers the entire pupillary area, and no red light comes from within the eye. If the patient, however, looks inward, i. e., towards

the nose, the pupil becomes red on transillumination, and the fundus is easily seen. By means of the Purkinje-Sanson's reflex it could be shown that the lens was in its proper place, and that the black mass behind the lens was displaced into the pupillary area. The vision was 2/70 when the patient looked straight ahead or inwards, while he could not see hand movements when he looked outwards. The projection of light was good in all directions, and the tension was normal. The field of vision of the right eye lacks the entire upper inner quadrant, while the lower inner is very considerably contracted.

We have, therefore, in the left eye, a subluxated lens, while in the right we must differentiate between a subluxated lens and a melanosarcoma involving the part of the chorioid lying near the corpus ciliare. The Purkinje reflexes show that the lens is not in its place, the change of position of the tumor with the resultant decrease in vision and corresponding defect in the field of vision make the diagnosis of intraocular tumor certain.

According to the principles of therapeutics, the right eye should have been enucleated, and the subluxated lens of the other eye, which still possessed perception of light, should have been extracted. I found myself in a dilemma—which operation should I recommend to my patient, who would not hear of an enucleation? I accordingly successfully extracted the lens by means of a section upwards, and the patient saw after the operation, with a convex 12D. lens, fingers at five meters. When he left, I again called his attention to the danger which the right eye afforded. Three months later he returned. His right eye then saw only hand movements, for the tumor had grown so large that there was no retinal reflex. Pain, however, was not present, nor was the eye irritated.

The patient reported in May at the University Eye Clinic with pain and secondary glaucoma, and Prof. V. Grosz told me that the eye was then enucleated.

The condition of the eye was interesting because the growth of the tumor could be watched step by step, and the differential diagnosis on one and the same patient between sarcoma of the chorioid and luxated lens was very instructive.

If the sarcomatous degeneration is not circumscribed, but extends over a considerable area of the chorioid, and if, nev-

ertheless, it remains subacute and does not affect the circulation of the eye, i. e., does not cause glaucoma, the conditions are then entirely different and the ophthalmic picture of another kind.

I remember the case of a sixty-year-old cook whom I examined several times, and who had absolutely no faith in my statement that her eye contained a tumor which should be removed as rapidly as possible. She had no pain, and the blindness which had existed for years had not annoyed her. In this case the refractive media were entirely clear, it was easy to look into the eye, and the entire fundus was uneven, and there was no trace left of disk or vessels. The tension of the eye remained normal for years and the condition did not change for years.

Not every intraocular tumor grows rapidly. I saw a woman with carcinoma of the breast who lived for years with a metastasis in the chorioid with glaucomatous symptoms or ciliary irritation. Such chorioidal tumors belong to the fibrous group, which develop slowly, spread even more slowly, and are always subacute.

In the diagnosis of intraocular tumors, or rather when the differential diagnosis cannot be made, the Sach's lamp or some similar transilluminating lamp can be of great value.

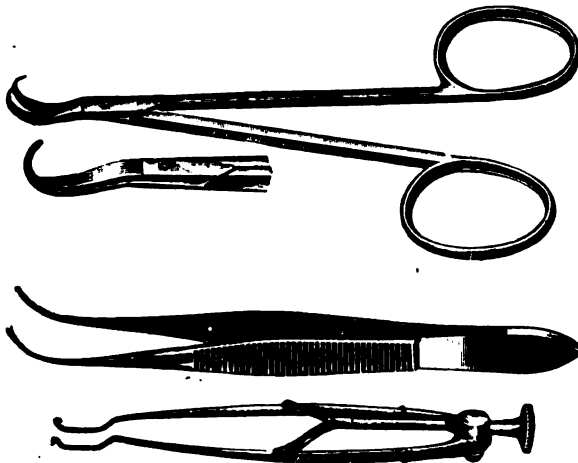
In describing these cases, it was my purpose to offer some contribution to the knowledge of intraocular tumors. From them it is evident that we seldom can trust the standards given by the text-books, because the ophthalmic picture varies with the origin of the tumor and the numerous variations of the clinical picture.

A NEW INSTRUMENT FOR PARTIAL TENOTOMIES.

G. GRIFFIN LEWIS, M. D.
SYRACUSE, N. Y.

For cases of muscular insufficiency or strabismus where a partial tenotomy is advisable, I have devised a special pair of scissors, which not only greatly simplify the operation but make results more certain.

The technique of the operation is as follows: After the usual incision through the conjunctiva and Tenon's capsule, the prongs of a Todd's muscle tucker are inserted beneath the muscle, then separated, thus stretching the muscle suffi-



ciently, so that the curved blades of the scissors can be introduced, one on each side of the muscle, and a crescent shaped piece of the latter of the desired size clipped off. The operation is completed in one stroke of the scissors, and the muscle is left in such a shape that it is impossible for the cut fiber ends to come in contact, reunite and produce a condition worse than before. To remove a crescent shaped piece with the ordinary tenotomy instruments, which we have now at command, is a rather difficult and complicated thing to do, and prolongs the

operation considerably. For this reason I have devised these scissors which will enable one not only to perform a very rapid operation, but with them he can cut out a perfect crescent shaped piece of the muscle at one clip, regulating the depth of his cut as the case may require. In convergent strabismus the result may be enhanced by clipping a few fibers from the nasal side of the superior and inferior recti muscles, while in divergent strabismus the same benefit may be derived by cutting a few fibers from the temporal side of the superior and inferior recti.

600 University Block.

The scissors are made by F. A. Hardy & Co., of Chicago.

THE OCULAR COMPLICATIONS OF MUMPS.

J. H. WOODWARD, B. S., M. D.,
NEW YORK.

(Continued from the January Number.)

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ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

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**A Case of Melanosarcoma of the Eye (Primary) and of the Liver
(Secondary).**

SCHOENBERG, M. I., and CAMAC, C. N. B., New York, (*New York Medical Journal*, Jan. 12, 1907), report a case in which an eye had been removed for melanosarcoma, and the liver became involved by the same disease nearly two years later. The striking features of the case are given as: 1. Failing vision two years before hepatic involvement. 2. Ocular pain and progressively failing vision one and three-quarters years before hepatic involvement. 3. Clinical diagnosis, glaucoma; pathological diagnosis, melanosarcoma. 4. Abdominal pain and mass in a patient with extirpated eye; no eye symptoms at this time. 5. No jaundice. 6. No ascites. 7. No hæmatemesis or melæna. 8. No varicosity of the veins of the abdomen or extremities. 9. No abdominal pains except at very early stage, and though these were severe, they resembled an attack of indigestion. 10. The sudden appearance of the tumor, the rapid development up to a certain size, beyond

which it did not go throughout the subsequent course of the disease. 11. Urine turning black and yielding melanin reaction.

The patient died March 3, 1906, about two and one-quarter years after onset of eye symptoms, and two and one-half months after onset of abdominal symptoms. M. L. F.

Cases Allied to Amaurotic Family Idiocy, With Remarks on the Pathogenesis of the Affection.

GORDON, ALFRED, Philadelphia, Pa. (*New York Medical Journal*, Feb. 16, 1907), published under the above title the clinical appearances in two children, one a boy nine years old, the other a girl thirteen years old, both of whom were deficient mentally and had atrophy of the optic nerve and retina. The boy had in addition polydactylism of both hands and both feet. The more frequently the reviewer read this article the more keenly he felt his density in that he could not perceive the resemblance between them and the disease described as amaurotic family idiocy by Dr. B. Sachs, but he was inclined to ascribe this to his own ignorance until a letter appeared in the *New York Medical Journal* for March 9, 1907, from Dr. B. Sachs, in which he protests against the article as misleading. He says: "It is not necessary to take up his statements in detail, for the cases to which he refers are so widely different from those described by Tay and myself that there is no possible resemblance between those to which he refers and the type to which he thinks they are allied." M. L. F.

The Ocular Complications of Mumps.

WOODWARD, J. H., New York (*New York Medical Journal*, Jan. 19, 1907), completes the history of a case of unilateral optic neuroretinitis due to infectious parotitis and resulting in blindness of the affected eye met with in a girl eleven years of age, the first part of which was reported in the *New York Medical Journal* of Jan. 2, 1904. Two years after the patient had been dismissed she returned with a marked anterior staphyloma which was very disfiguring. The eye was enucleated and the following pathological report is appended which the author claims is the only one ever reported in a case of this nature.

"Cornea in fairly good condition, epithelium intact.

Bowman's membrane and Descemet's membrane intact and well marked.

Cornea propria has the appearance of having presented slight opacities.

Iris presents quite a large amount of pigment and is atrophied. There is an anterior synechia with fusion a distance one and one-half millimetres from the angle.

Fontana's spaces and Schlemm's canal obliterated.

Posterior chamber greatly deepened, the anterior segment of the globe having been pushed forward.

Lens in a condition of cortical cataract.

Ciliary body and processes atrophied.

Retina: The inner layers appear to have taken on a connective tissue proliferation, and in some portions this tissue takes on hyaloid form, especially in the neighborhood of what appears to have been vessels which it appears to have obliterated. The remainder of the retina is completely disorganized. The external limiting membrane can be seen, but the rods and cones have entirely disappeared.

Chorioid has in some places apparently fused with the sclera where it has disorganized. In other places it is apparently free and engorged with blood.

Sclera appears to be normal.

Optic nerve: Section shows complete atrophy of the nerve fibers which have been replaced by a very dense hyaline connective tissue. There is an extensive obliteration of the small vessels in the sheath of the nerve. The obliterated vessels appear as hyaline islands. There is considerable pigment, light brown and black, scattered through the tissue replacing the nerve near its entrance to the sclera." M. L. F.

Obstruction of the Central Retinal Vein.

(Author's abstract.)

VERHOEFF, F. H., Boston (*Archives of Ophthalmology*, Jan. 1907). The ophthalmoscopic picture of thrombosis of the central vein has generally been regarded as definite and characteristic. Yet in a large proportion of the cases examined anatomically in which this diagnosis has been made, the central vein has been found patent and comparatively normal, while in some of the cases it is probable that a coagulum due to the

fixing agent or the appearance produced by a longitudinal section of the vein wall has been mistaken for an obstruction. In fact, previous to the recent publication of Harms, obstruction of the vein had been conclusively demonstrated in no more than six cases, in each of which it was attributed to thrombosis. Of the eight cases of Harms the obstruction was described as due wholly or in part to thrombosis in six. The infrequency with which obstruction of the central vein has been demonstrated, however, is not necessarily an indication that the condition is excessively rare. More probably it is chiefly an indication of the infrequency with which the optic nerve is examined in serial cross sections.

An analysis of the reported cases goes to show that the obstruction in the vein was certainly due to thrombosis in only two cases, in each of which it occurred as the result of sepsis. In the other cases the histological evidence was not only insufficient to show that it was due to thrombosis, but indicated that it was due to endophlebitis proliferans. The obstructing mass consisted either entirely of connective tissue or partly of proliferated endothelial cells, and contained no remains of degenerated blood, such as blood pigment, while the adventitia of the vein around the obstruction showed no undue vascularisation or other signs of inflammatory reaction.

The writer has examined, by means of serial cross sections, six cases of obstruction of the central vein. With the cases from the literature, excluding the two cases of septic thrombosis, these make a total of eighteen cases from which deductions may be drawn. Of the patients, six were female. With the exception of Harms' Case ix., aged 20, in whom glaucoma was perhaps the primary factor, the ages were between 48 and 70 years. The average age was 58 years. Albuminuria was present in three cases, absent in eight, and not noted in seven. In five cases there were definite signs of general arteriosclerosis. No mention was made of syphilis or alcoholism as etiological factors, and it seems safe to conclude that the chief etiological factor was senility. Few cases were followed sufficiently long to afford any data as to prognosis in regard to life, but the presumption is that this must be unfavorable. In two cases the eye was obtained at autopsy, and in two others death occurred within three years after the enucleation. One

patient was alive at the end of five years. Another was alive at the end of eight years, but during that time had several severe apoplectic attacks, as well as an attack of hemorrhagic retinitis in the other eye. In all except one case the obstruction was situated either entirely within or more often behind and partly within the lamina cribrosa. This is perhaps accounted for by the fact that here the nerve, and with it the vein, is necessarily subjected to its greatest strain during the ocular movements. This might act as a stimulus sufficient to cause proliferation of an intima already on the point of senile hyperplasia.

An interesting question is the relation of obstruction of the central vein to glaucoma. In v. Michel's case glaucoma did not ensue even after sixteen months' observation, to which fact is evidently due the error handed down in the text-books that obstruction of the central vein does not give rise to glaucoma. As a matter of fact, with the exception of one other case in which death shortly occurred, glaucoma was present in all of the cases examined anatomically. But, as Ischreyt has pointed out, the frequency with which it occurs in such cases may be misleading from the fact that as a rule only those cases in which glaucoma ensues come to enucleation. More important than the frequency of the glaucoma in these cases is the fact that in all but one of them it was monocular. The conclusion from this would seem to be almost inevitable that the obstruction in the vein was the cause of the glaucoma in most of them. Moreover, the writer's first case showed conclusively that acute glaucoma may be due to this cause. On the other hand, the fact that in many of the cases acute symptoms did not occur until the glaucoma had reached an advanced stage, as evidenced by deep cupping of the optic nerve, would seem to indicate that in some cases the obstruction was secondary to or independent of the glaucoma. Further observations are necessary, however, before the question of the relation of chronic glaucoma to obstruction of the central vein can be fully answered.

The clinical features of the writer's first case were briefly as follows: When first seen the patient stated that the sight of the left eye had been blurred for a week. Ophthalmoscopic examination showed the typical picture of thrombosis of the central vein. The tension was normal, and there was no pain.

Vision was reduced to light perception. Thirteen days later the eye became very painful, was stony hard, and showed the appearances characteristic of acute congestive glaucoma. Iridectomy was performed without benefit, and enucleation was carried out for the relief of pain six days after the onset of glaucoma.

The anatomical examination of this case showed that the pathological changes were much more recent than in any other case yet reported. The central vein was found completely occluded, but not by a thrombus. The obstruction was due entirely to obliterating endophlebitis, and not even in part to thrombosis. Behind the obstruction the vein was still completely collapsed, conclusive evidence alone that the condition was of recent date. The optic disk was not cupped, and showed no papillitis. The retina showed numerous hemorrhages and marked edema, but was otherwise practically normal. The glaucoma was no doubt due to the excess of albumin in the vitreous humor derived from the retinal veins and capillaries. That the vitreous humor was loaded with albumin was shown by the fact that it was found coagulated by the action of the formaline when the eye was opened.

The other cases of the writer were cases of advanced glaucoma with more or less indefinite clinical histories, in which the relation of the obstruction in the central vein to the glaucoma was not clear. The obstruction in each was due partly to sub-endothelial proliferation of the intima and partly to endothelial proliferation into the lumen. One case was of especial interest, because it showed a condition that heretofore has been regarded as due to canalisation of a thrombus. A few sections behind the main obstruction, the lumen became of almost normal size, but was subdivided by septa into three separate compartments lined with endothelium and filled with blood. The complete set of serial sections showed that the condition was due to undermining of the degenerated intima by the blood-stream from a small collateral. Instead of separating the intima all around, this caused it to bulge out in two places only, due no doubt to the fact that it was more loosely attached here. The new lumina thus formed became lined by endothelium, probably by extension from the collateral and through breaks in their walls.

CONCLUSIONS.

Complete obstruction of the central retinal vein, with the classical ophthalmoscopic picture of thrombosis of this vessel, may be produced by endophlebitis proliferans without thrombosis. The proliferation may involve the sub-endothelial tissue alone, or the obstruction may be completed by a more active endothelial proliferation into the lumen.

All of the cases anatomically examined in which obstruction of the central retinal vein has been attributed to non-septic thrombosis, can be explained by, and in all probability were due to, endophlebitis proliferans alone.

The so-called canalised thrombus of the central retinal vein is in the nature of a dissecting aneurism.

In certain cases obstruction of the central retinal vein may early give rise to acute glaucoma.

Some Unusual Ocular Manifestations of Arteriosclerosis.
(AUTHOR'S ABSTRACT.)

ZENTMAYER, Philadelphia (*Journ. A. M. A.*, March 2, 1907). The unusual manifestations treated of are *optic atrophy and visible spasm of the central artery of the retina*. The author points out that post-mortem examinations have proven that optic atrophy may be produced by sclerosis of the vessels at the base of the brain. Otto found out of a series of 20 autopsies in which there was sclerosis of the basal vessels, 11 in which there were more or less marked changes in the form of the optic nerve; primarily, centrally situated but later extending above and below, while in the wings of the nerve thus formed the position and relation of the nerve fibers remained normal. In none of the cases was it possible to determine any ophthalmoscopic and functional changes. Bernheimer found the optic nerve divided into two unequal longitudinal parts by pressure of the sclerosed carotid and ophthalmic arteries on the ventral surface. In a second case the optic nerve was furrowed on its *dorsal* surface from pressure upon the edge of the dural sheath. Liebrecht concludes from these and from consideration of 7 cases of his own that the most frequent seats of injury to the optic nerve are: first, within the fibrous portion of the optic canal by imbedding of the ophthalmic artery into the nerve parallel to its long axis;

the second is at the sharp free margin of the reduplicated dural sheath where it spans the nerve near the optic foramen; (the nerve may be extensively compressed between this fibrous band above, and the ascending carotid below); the third lies midway between the canal and the chiasm, the place where the anterior cerebral artery above, and the carotid below, cross the nerve. He says that as to the functional disturbance occasioned we have no positive evidence, but it may be assumed that as the result of injury at the first point we would have either no functional disturbance, or an atypically placed scotoma; at the second, an incomplete or a total transverse atrophy of the nerve with corresponding visual defect; at the third, the lesion and the functional disturbance would vary with the relative position of the two vessels.

Z's contribution is a clinical study. A woman 43 years of age 18 months ago began to have attacks of dizziness accompanied by temporary blindness. The blindness affected both eyes and lasted from 5 to 10 minutes. At first both eyes recovered fully, but later the lower half of the right field would be slow to recover. This tardiness increased until, for a year past this portion of the field has remained permanently blind. The left eye has been going through the same process, the upper half of the field, however, being slow in recovering. The ophthalmoscope showed decided atrophy of the upper half of the nerve with very marked contraction of the superior branch of the central artery with accompanying white lines. All of the vessels showed fibrosis. The author believes that the attacks of transient blindness were due to spasm of the vessels which is known to result frequently in the early stages of arteriosclerosis. Later the sclerosis advanced and pressed the nerve upwards against the unyielding edge of the internal end of the fibrous canal causing a transverse pressure atrophy.

Spasm of the Central Artery of the Retina.—The author points out that whereas transient blindness, usually monocular, is not of rare occurrence and has been ascribed to various causes, of late more frequently to spasm of the central artery, there are but three cases on record where this condition has been observed with the ophthalmoscope, Wagenmann, Benson and Sachs. (Since Z's paper a fourth by Lundie.) Zentmayer's case has been reported in full by Harbridge in "Oph-

thalmology" July, 1906. In a man 49 years of age with a history of syphilis and migraine, transient blindness occurred. During the attacks the following phenomena were observed: A moderate contraction and distinct flattening of the arteries and veins at the onset of an attack of blindness. When the blindness is complete the arteries become ribbon-like and lose their reflex and the veins, especially the superior branch, become very narrow. After a brief period there is a gradual re-filling of the arteries and veins, the latter becoming greatly distended, particularly the inferior branch. During the last attack that was observed, the last of a long series occurring at half hour intervals, there appeared to be some retinal haze about the disk. There were never any macular changes. The pupil dilated synchronously with the loss of vision, and for a while after the attack exhibited hippus.

Prognosis.—In considering the prognosis of transient blindness a distinction should be made between those cases where the attack is but a symptom of a general condition in which spasm is a feature, as epilepsy, Raynaud's disease, migraine and the ague of intermittent fever, in which the prognosis is good, and where it is due probably to a local manifestation of a general vascular disturbance in which the prognosis is grave. In the latter class the danger lies mainly in the secondary effect of the spasm, for, excluding the cases in which a reasonable doubt may exist as to the cause of the ischemia, there yet remain several cases in which, although the blindness lasted for many hours, a full recovery of retinal function followed.

Treatment.—The question of the advisability of performing an iridectomy must be decided for each individual case. We have seen that recovery has followed alteration of circulation brought about by performing paracentesis of the anterior chamber and that iridectomy has failed in the one case of undoubted spasm in which it was done. The performance of an operation whose action is problematic for the relief of a condition which, if not problematic, is perhaps only the local expression of a general condition will not appeal to every one. It would seem that the operation might be justified where the obstruction had resisted the usual means employed for relief until permanent injury to vision was likely to result. But that

it would guard against subsequent attacks is scarcely to be expected.

Enucleation of the Eye With Cocaine Anesthesia: Subjective Sensation on Severance of Optic Nerve.

(AUTHOR'S ABSTRACT.)

ELLIS, DR. EDWARD KEITH, Boston, Mass., and LANGWORTHY, DR. HENRY GLOVER, Dubuque, Iowa (*Archives of Ophthalmology*, January, 1907). Enucleation can be easily and very nearly painlessly done under the influence of cocaine if we have, *first*, an intelligent patient; *second*, a patient who has arrived at years of discretion; *third*, an eye moderately free from intense inflammation. In case the eye is inflamed holocain 1% may be used, since this drug acts better on inflamed tissue than cocaine. General anæsthesia, of course, is best in the general run of cases, but if we have any one of the three above conditions, local anesthesia can be employed perfectly well, especially since it is unaccompanied by the disagreeable and nauseating after effects of ether; and to a patient who has any real or fancied lesion of the heart, lungs or kidneys, it is as a rule greatly to be preferred. The method found to be the best is that of anesthetizing the conjunctiva with a few drops of a four per cent solution of cocaine. The conjunctiva is then cut close to corneal margin and dissected back until the muscles are reached. Cocaine solution from $\frac{1}{2}$ to 4% is then injected along the course of the ocular muscles with a curved hypodermic or lacrimal needle, taking particular care to thoroughly anesthetize the region occupied by the entrance of the optic and long and short posterior ciliary nerves to the globe. The usual method of procedure in any enucleation is then employed. A subcutaneous injection of morphia may be given about fifteen minutes before the operation. The following mixture, advocated by Terrien, may be used to inject about the posterior portion of the globe instead of cocaine alone:

Hydrochlorate of cocaine.....	
Hydrochlorate of morphine	aa .01
Stovaine
Sodium chloride	aa .02
Distilled water	5.

One c. c. of this solution may be injected, and the nerve cut with but slight discomfort.

A Case of Secondary Hypernephroma of the Iris and Ciliary Body.
(AUTHOR'S ABSTRACT.)

CHANCE, BURTON, Philadelphia. (*Transactions American Ophthalmological Society*, 1906, and *Journal American Medical Association*, Feb. 9, 1907, p. 475.) A man, aged 40, by accident noticed on his left iris a tumor which had given rise to no distinct subjective symptoms, nor had the eye become inflamed. A vascular tumor was seen projecting from the anterior surface of the iris and pressing against the cornea. After a few days the size and shape of the tumor altered considerably. In each eye were signs of progressive chorioretinitis. The man had had syphilis, and there were nodules beneath the skin of the thorax near the cartilages. A short course of mercurialization was followed by diminution in the size of the nodules, but the iris tumor was not affected thereby. A diagnosis of sarcoma of the iris was made and the tumor was excised by iridectomy. The wound healed promptly. The histologic characters of the tumor resembled those of hemangiomatous sarcomata. Later, symptoms of cyclitis set in suddenly and the man became cachectic. The eyeball was removed at the patient's request. On microscopic study a tumor was discovered in the ciliary region and the retina showed signs of infiltration. The socket healed, and no growth appeared in it at any time. The man's general health failed rapidly. An intestinal intussusception occurred. When the abdomen was opened many neoplasms were seen in the viscera. The intussusception was reduced, but later a faecal fistula formed in the abdominal wall. The patient sank rapidly and died nine months after the first appearance of the tumor on the iris. The post-mortem examination showed the presence of tumors in nearly all the abdominal viscera, the original growth being in the left kidney. The structure of all these tumors was that of the hypernephromata and corresponded exactly with that of the ocular growths. The tumors from the chest and one from the enlarged inguinal gland were likewise secondary deposits.

The very full history of the case which the author gives shows that at the beginning the case appeared to be one of a primary tumor of the eye with a probable connection with the internal organs. The examination after the death of the patient proved that the process was the reverse, and further study

showed that it was of unusual pathogeny, with manifestations in an organ not hitherto mentioned as having been the seat of a secondary invasion by such a tumor.

The result of the study of his case leads Chance to wonder what a thorough examination of the internal organs in cases of ocular tumors with fatal metastasis might lead to if it were possible to follow the cases to necropsy. In an analysis of the histories of primary tumors of the eye, the records show that it has not always been possible to do this. The relations, therefore, as to cause and effect, between the ocular tumors and the internal growths, have not in all cases been defined. And the author asks: "May it not be true, then, that many instances of so-called primary tumors of the eye, which come under the observation of the ophthalmic surgeons, and in which the opportunity for a confirmation autopsy has been lost, are, in reality, secondary to some concealed primary growth?"

Conjugate Deviation of the Eyes and Head and Disorders of the Associated Ocular Movements, in Tumors and Other Lesions of the Cerebrum.

(AUTHOR'S ABSTRACT.)

WEISENBURG, T. H., PHILADELPHIA (*Journal of the American Medical Association*, March 23 and 30, 1907), says that the functions which are concerned with the movements of the head and eyes are perhaps the most highly specialized of all functions, the auditory and visual senses probably playing the most important part in the determination of these movements. The cerebral mechanism concerned is most complex. In the human being there is but one cortical oculomotor center, or at least one functioning center, situated in the posterior portions of the second and third frontal convolutions, adjacent to the precentral convolution. It is held by some that there are true motorocular centers in the occipital lobe and in the angular gyrus. These assertions, however, do not bear close investigation. It may be that in the animal scale below man there is a true functioning motorocular center in the occipital lobe and that in man this is in abeyance.

A separate center exists for the movements of the head, probably in the lower anterior portion of the precentral convolution. There is probably in man a distinct center for the combined movements of the eyes and head, situated between

the head and eye centers. It is probable that the cortical oculomotor, head and combined head and eye centers are subdivided for lateral as well as for upward and downward movements.

The above views are supported by the myelogenic investigations of Hechsig, the abundant physiological experiments by numerous authors with the electrode, and the instances of limited cortical lesions.

The oculomotor and the motor head centers are in connection by means of association fibers with the cortical centers for the special senses, in the temporal, occipital, uncinate and other lobes. Any lesion in these motor centers or in the related special sense centers, or in the association fibers connecting the former with the latter, will cause an impairment in the voluntary deviation of the eyes or of the head, or of both, this depending on the nature and the seat of the lesion. It is probably because of the involvement of the visual and auditory fibers lying underneath the angular gyrus, that conjugate deviation so constantly occurs, and not because of a special motor center in this area, as is so commonly held by certain French authors.

The theory of Bard, only recently advanced, that conjugate deviation of the eyes and head is always or nearly always accompanied by homonymous, lateral hemianopsia and dependent upon this, is an error, for in the majority of instances hemianopsia does not exist. In the 16 cases with necropsy recorded in this paper, hemianopsia was demonstrated in only three. One of the sources of error not heretofore recognized, and first pointed out in this paper, is the fact that hemianopsia may be caused by the direct or transient effects of the hemorrhage, this loss of half vision being only a temporary symptom similar in nature to the temporary hemianesthesias sometimes observed in capsular lesions. In other words, the temporary hemianopsia is as much dependent upon the lesions as the conjugate deviation.

Conjugate deviation of the eyes and head probably occurs in every case of large apoplectic lesion, but in more instances it is a partial or minor form and transient in duration. A good term for it is ocular hemiplegia. Its recurrence as a distinct and isolated symptom *is of no diagnostic value*, be-

cause conjugate deviation of the eyes and head may be the result of a lesion in any portion of the cerebrum. It may be of value, however, when it occurs in conjunction with other focalizing symptoms.

The author does not admit the occurrence of basal co-ordinating ocular centers. There is no need for such, and there is no evidence that such centers exist. The recent attempts of certain authors to establish automatic oculomotor centers in the optic thalamus cannot be supported. Should such centers exist in the thalamus, lesions of these should cause forced or incoordinate ocular movements. This has not been demonstrated.

The author holds the view that convergence and divergence are not reflex acts, dependent on a basal center, but are associated ocular movements similar to lateral and upward movements. They probably have cortical centers in the posterior portions of the second and third frontal convolutions. The movements of convergence and divergence are probably brought about by associating tracts in the pons and cerebral peduncles, similar in nature to the tracts concerned with lateral and upward associated ocular movements.

Paralysis of associated ocular movement may occur as a result of a brain anopsia. This, however, is only temporary.

The Treatment of Simple Chronic Glaucoma by Miotics.

POSEY, Wm. C., Philadelphia. (*Journal A. M. A.*, Feb. 23, 1907.) The object of the paper is to extol the action of miotics in the treatment of simple or non-inflammatory glaucoma, to call attention to the very satisfactory results which attend the use of these drugs in this class of cases, and to urge their more intelligent and persistent administration. The writer asks, Is there positive evidence that miotics are of less value than iridectomy in the treatment of chronic glaucoma? Have statistics ever been compiled of groups of cases, the one treated by miotics and the other by operation, which prove this assertion and indicate the superiority of iridectomy over these drugs? So far as he is aware, the only statistical study of any large series of cases of chronic glaucoma treated with miotics was that prepared by Dr. William Zentmayer and himself in 1895. At that time the histories of 167 cases of

chronic glaucoma were collected, and from these records deductions were drawn which were thought to be fairly conclusive regarding many phases of the disease, including different methods of treatment. The conclusions, the result of these studies, were, that the effect of the administration of eserine and of the performance of iridectomy in checking the course of the disease is proportionately the same in the treatment of simple chronic glaucoma. As operative procedures are always to be deprecated when other means are equally valuable, eserine should be employed in all cases of the disease. If at the end of a month the extent of the field has diminished, iridectomy should be resorted to, as there will be nothing further to be expected from the action of the drug. If at the end of that time, however, an improvement is noted, the drug should be continued, as there is reason to expect that a beneficial action will be exerted for ten months on the extent of the field and fifteen months on the visual acuity. After iridectomy is performed there is reason to believe that the course of the disease will be checked for a period of eighteen months in 50% of the cases. Eserine is powerless in 20%; iridectomy, in 10% of the cases. In estimating the value of his conclusions, the writer states it should be borne in mind that they were drawn from a study of dispensary patients and that many of these were under treatment at a time when the manner of administering miotics to the best advantage was not thoroughly understood. His later observations, both in private and dispensary service, would indicate that were it possible to compare an equal number of cases which have been subjected to the action of miotics properly administered over a similar period, the comparative merits of miotics and iridectomy would be shown to be far greater in favor of the former. For elucidation of the subject, the writer considers the subject under the following heads: 1. Beginning Cases. 2. Advanced Cases. 3. Pronounced Glaucoma in One Eye, the Other Being Unaffected, or With Only a Glaucomatous Tendency.

I. *Beginning Cases.*—He designates as beginning cases those which have possessed the tendency to glaucoma for a number of months or years and are now manifesting some positive signs of the disease, the tension being, perhaps, more

or less elevated, the cupping demonstrable, or some restriction or scotoma having appeared in the visual field.

II. *Advanced Cases.*—Under this class is considered the not uncommon type where vision in one or both eyes has been seriously compromised by the marked restriction of the visual field, either peripherally by cutting, or centrally by scotoma. All advocates of iridectomy caution about the danger of operating under such circumstances, as it has been a common experience that total blindness has not rarely followed surgical interference. Cases of this type have usually been regarded as hopeless, and blindness, within a few months at best, has been considered to be inevitable. Miotics may be of great service, even in this type, and may accomplish truly wonderful results.

III. *Pronounced Glaucoma in One Eye, the Other Being Unaffected, or With Only a Glaucomatous Tendency.*—Glaucoma is essentially a binocular disease, though a very long period may elapse before both eyes are affected. It not infrequently happens, therefore, that the ophthalmologist is called on to treat one eye in an advanced stage of glaucoma, while its fellow is either normal or presents changes which indicate in a general way merely a glaucomatous tendency. Experience has shown that when iridectomy is performed on the more affected eye, in glaucomas of a congestive type, a glaucomatous outbreak is frequently precipitated in the other eye. On this account authorities advise the performance of iridectomy on the fellow eye as soon as the wound in the eye operated on has healed, and believe that this procedure should be preferred even in cases of chronic glaucoma, where there are indications that if it is not already the seat of glaucoma it is liable to become so.

While his experience leads him to agree heartily with this advice in the treatment of all forms of congestive glaucoma, he does not believe that the same ruling should be made applicable to cases of chronic glaucoma, for he has never seen an acute attack precipitated in the fellow eye by an iridectomy on an eye which was the seat of a non-congestive type of glaucoma. In the cases of chronic simple glaucoma which are occasionally met with where a glaucoma of a congestive type, despite the continuous use of eserin, has devel-

oped from a chronic simple glaucoma, iridectomy is, of course, indicated and should be performed, but even under such conditions he has never seen an outbreak follow in the fellow eye when it had been properly guarded by miotics. It goes without saying, almost, that in event of operation in this class of cases the maximum effect of a miotic should be obtained some time before the operation, and that the administration of the drug should be continued in the fellow eye, even if it manifests no symptoms of glaucoma, as long as the patient lives.

In order to gain the full benefit from miotics in the treatment of glaucoma, it is necessary that they should be properly administered. It must be remembered that the effects of eserine and pilocarpine persist for two or three hours only, so that the dose should be repeated at the end of this period if their action over the pupil is to be constantly maintained. Small doses of the drug should be used in the beginning and gradually increased until the desired effect is attained, and in the maintaining of the action by still further, but less frequent, increase in the strength of the solution employed. Gentle massage of the eyeball is of decided advantage, and should be practiced several times each day, for five minutes at a time. The patient should be instructed as to the number of hours each day the eyes should be used in near vision; illumination and posture of the patient, etc., should be taken into account. Proper lenses should be adjusted to the eye both for near and far use, and a large number of hours daily should be spent in the open air, while the general constitutional condition of the patient should be carefully looked after.

H. G. G.

A Case of Metastatic Carcinoma of the Iris.

PROCTOR, F. I., A. M., M. D., BOSTON. Pathological examination by Verhoeff, F. H., M. D., Boston. (*Archives of Ophthalmology*, January, 1907.) Metastatic carcinoma of any part of the eye is comparatively rare. As is well known, the metastases are most frequently situated in the choroid, about forty such cases having been reported. Three cases have also been reported in which the metastases occurred in the ciliary body. The writer reports a case in which the iris was

the only part of the eye attacked, which he believes is the only case of its kind on record. The specimen submitted for examination consisted of a small piece of iris tissue containing a tumor 6 mm. x 2 mm. x 3 mm. in size, which upon microscopic examination was found to be growing entirely within the stroma of the iris, while all that remained of the iris stroma were its blood-vessels and a few strands of connective tissue radiating from them. The most striking feature of the growth was its extraordinary abundance of mitotic figures. This would indicate the highly malignant character of the growth, which the writer, by a process of differentiation, diagnoses metastatic carcinoma of the iris. H. G. G.

A Dissecting Spatula.

LANDMAN, DR. OTTO, TOLEDO, OHIO. (*Archives of Ophthalmology*, January, 1907.) The instrument is of the usual length, the blade is 25 mm. long, narrows slightly toward the tip, and is 5 mm. wide. It is stiff and yet flexible enough to yield to pressure. It is slightly curved on the flat, making it more efficient. The blade is thin, thus furnishing edges which will not cut, but will readily serve for dissection. In evisceration it is useful in separating the uvea from the sclera; in pterygium operations, for dissecting the conjunctiva free; in the advancement of a muscle, it serves the same purpose. In separating cysts from the surrounding tissue, it dissects without cutting. In short, this instrument can be used on the eye or the orbit when any blunt dissection is to be made. H. G. G.

A Case of Congenital Staphyloma of the Cornea.

RUNTE, DR. JOSEF, WURZBURG. Translation by Foster, Dr. Matthias Lanckton. (*Archives of Ophthalmology*, January, 1907.) An infant was found to have a staphyloma of the right cornea on the day of its birth, ulceration appeared three days later, and on the following day the eye was enucleated. Except for some conjunctivitis which was not blenorrhoeal in character, the left eye appeared to be perfectly normal. Macroscopically there were no pathological changes to be seen in the posterior part, but anteriorly the cornea had been replaced by a protruding, globular, whitish tissue. Microscopically the entire staphyloma was very irregular, the anterior corneal

epithelium was present only in places, its stratification was normal, but it was thickened in places and somewhat infiltrated with leucocytes. It also contained peculiar cells, part of them with round, part with oval, part with elongated nuclei, lying for the most part excentrically, each surrounded by a bright space. The epithelium was found to be undergoing proliferation, and the substantia propria was everywhere replaced by a cicatricial tissue permeated with lymphocytes. Numerous vessels distended with blood were cut across in the tissue of the staphyloma, and there was no trace of Bowman's or Descemet's membrane. In the peripheral sections was a rather large oval cyst lined with laminated pavement epithelium which presented karyokinetic figures in various stages. The posterior surface of the staphyloma was covered with pigment, but in the region corresponding to the pupil it was absent or very sparse. No traces were to be found of Fontana's spaces or Schlemm's canal. The posterior chamber was filled with coagulated fibrin and leucocytes with numerous pus cells, and the spaces between the ciliary processes were also filled with leucocytes. The ciliary muscle on each side was poorly developed. The shape of the lens was varied and the lens capsule was normal except for a wavy outline. Between the lens fibres were spaces of various sizes filled with fluid. Some of the fibers were opaque and swollen, and others changed to vesicular cells. The vitreous was shrunken and fibrous with a few leucocytes about its periphery. There were no pathological changes in the chorioid, pigment epithelium, or retina. The layer of rods and cones was in good condition. The papilla had no glaucomatous excavation, the central vessels were well filled with blood, and the tissue of the nerve was normal. The writer suggests, as the cause of the condition, intra-uterine inflammation through the agency of bacteria.

H. G. G.

The Dependence of Accommodation and Mobility on the Refraction of the Eye.

KNAPP, HERMAN, M. D., New York. (*Archives of Ophthalmology*, November, 1906.) The writer contends that experience has taught us that the emmetrope sees perfectly at a distance without an effort; while the hyperope has to strain his ciliary muscles to see clearly, even at a distance. Without

convex glasses he tires, which causes asthenopia and headache. The myope does not see clearly at a distance without suitable concave glasses. Nearsighted eyes have, as a rule, exophoria. A hyperope with $+2.00$ D. has to accommodate, i. e., contract his ciliary muscle, to the effect of $+2.00$ D. in order to look without a strain in vision at distance. As a nerve impulse is sent into the muscles of accommodation, it will be sent also into the muscles of convergence; for both functions are affected by voluntary muscles which receive the same impulses. When we disrupt the convergence with a vertical prism, the hyperopia remains, and the convergence can be measured by Maddox glass rods, or Stevens photometer; as a result, we find this patient has also about two degrees of esophoria. When now, as a counter-test, we hold a plus $+2$ D. spectacle glass before the patient's eyes, the hyperope of $+2$ D. sees clearly without an accommodative effort, and the esophoria is wanting, but it appears when the plus glass is removed. This shows that the same nerve impulse was sent to the internal recti as well as into the ciliary muscles. In myopic eyes the conditions are the same in character, but with negative glasses. They do not, however, in the writer's experience, give as uniform results as the hyperopes. The writer claims that plus glasses may do harm if they are too strong, having observed several cases of hyperopes that wore convex glasses and had divergent squint. This disappeared after the glasses were made weaker. The author mentions, to prove that the combined action of muscles of accommodation and the internal recti are excited by one nerve impulse, the Argyll-Robertson pupil, and the effect when both pupils are dilated with atropin. The pupils are dilated, and the accommodation is paralyzed, but not the convergence. Practically all these experiments have shown that the heterophorias are not insufficiencies, and that the treatment lies in the spectacle-case and rarely only in the operative-box.

H. G. G.

Double Congenital Aniridia with Glaucoma and Cataract—Extraction With Resulting Good Vision—Observations on the Action of Eserin Where the Iris Is Absent.

DENNIS, DR. DAVID N., ERIE, PA. (*Archives of Ophthalmology*, November, 1906), reports a case of total absence of

the iris and ciliary bodies. The usual glaucoma found in congenital aniridia cannot in this case be caused by the pushing forward of the rudimentary iris into the ciliary angle, thus obstructing drainage. The vision at the time of the first examination was finger-counting at six inches in O. S., light perception in O. D.; pronounced nystagmus, O. S. Cornea clear in O. D., slightly cloudy in O. S. Total absence of iris and ciliary bodies in O. D. Lens in O. D. totally opaque. O. S. partially mature. O. S. lens extracted without accident; smooth recovery. For two weeks following the operation the tension was normal. After this a notable plus tension was again present. The use of eserine twice a day brought the tension down to normal with a spherical plus 14. Vision equal 6/60. The tension thereafter remained normal. He has no trouble attending to his work and suffers no pain. One of the most interesting features in this case is the action of the eserine in reducing the tension. It is usually thought that the lowering of the eye tension by the use of eserine is produced by the myosis.

H. G. G.

A Rare Path of Infection of an Orbital Abscess.

BARCK, DR. C., ST. LOUIS. (*Archives of Ophthalmology*, November, 1906.) A boy eight years of age was struck on his right temple by a stone thrown by another boy. Two days later high fever set in, on the third day the upper lid commenced to swell, and on the next he was unable to open his eye. Temperature 104°. Patient somewhat comatose and delirious, which symptoms increased during the following days. Five days after the injury, there was a small irregular wound on the temple, about 2 mm. long, which looked as if made by a sharp-pointed instrument. It contained some discolored purulent secretion. There was apparently a fracture of the bone, and the upper lid of the eye was enormously swollen, red, and edematous. There was exophthalmos of considerable degree, and the patient complained of severe pains in the eye and head. The diagnosis was that of an orbital abscess, but on account of the benumbed sensorium and the delirious condition, the possibility of an infective thrombus of the cavernous sinus and ophthalmic vein was also taken into consideration. It was decided to explore the or-

bit, with the result that what was supposed to be a fracture of the bone proved to be the edge of a large emissarium. Free incisions in different directions in the orbit failed to evacuate pus. By the following day, however, the dressings were saturated with pus and the exophthalmos had considerably subsided, showing that the abscess had emptied. The fact that an emissarium was found, and that the tissues of the assumed path of infection were found perfectly healthy, led the author to examine a number of skulls. There is normally an emissarium present 15 to 25 mm. above the outer edge of the supraorbital margin, sometimes quite large. It is not mentioned in the current text-books of anatomy, although it is certainly important from a surgical standpoint, because it is much exposed to injuries and consequent possible infection. From the aperture the canal leads down into the diploe. In the elongation of this direction we find that the outer portion of the roof of the orbit is perforated by a number of small foramina. It now becomes apparent that this must have been the path of infection from the emissarium into the diploe, thence through these foramina into the orbital tissue. The subsequent course confirmed these conclusions. The patient recovered; the exophthalmos had disappeared. The upper lid could be raised about half of the normal degree. The vision was fairly good. On account of very flabby granulations, the wound closed slowly and was finally cicatrized fully. Later, after a slight attack of meningitis, with recovery, the vision equalled 6/7, fundus normal, and movements of both eyes normal. H. G. G.

Sudden Blindness Following Suppurative Conditions About the Eyeball.

KNAPP, ARNOLD, M. D. (*Archives of Ophthalmology*, November, 1906.) Sight is occasionally lost when there is an acute suppurative process in the neighborhood of the orbit. The orbital symptoms are those of a cellulitis of a varying intensity. The ophthalmoscopic picture is that of an embolism of the central retinal artery with consecutive optic atrophy and obliteration of the arteries. The writer cites three illustrative cases, in which the ophthalmoscopic picture differs from that of the common occlusion of the artery from thrombosis or embolism, in that the whitish haze of the retina

and disk is more marked, and that the subsequent transformation of the arteries into white lines is more constant.

H. G. G.

An Episcleral Osteoma.

VINSONHALER, FRANK (*Amer. Journ. of Ophth.*, October, 1906), reports the following case: Male, aet. 50, white, Irish descent, complained of sensation of a foreign body in the right eye, accompanied by burning, itching and photophobia. Inspection showed, apparently, a foreign body two-thirds the size of a pea imbedded in the sclera and surrounded by moderate injection to an extent of five or six millimeters.

Upon removal under cocain, the mass proved to be bony, five by two by four millimeters in size, irregularly oval and faceted at its attachment to the sclera. A fibrous capsule enveloped the mass, which was firmly adherent to the sclera midway between the external and superior recti muscles and about five millimeters posterior to their insertion. Recovery was uninterrupted.

Vinsonhaler states that the condition must be extremely rare, as Saemisch records twenty cases, only one of which is accredited to America. being reported by Loring twenty years ago. In nineteen of these cases the growth occurred at the same point as Vinsonhaler's case, leading Saemisch to believe the cause to be an embryonal fault. Spencer Watson reported the remaining cases where the growth was found between the superior and internal recti muscles, believing it to be an ossification of a particle of cartilage. The age of the reported cases varied from three months to thirty-six years, Vinsonhaler's case being exceptional, as the patient was fifty years of age. In none of these cases did discomfort arise until discovered accidentally.

Vignes reports the histological findings as identical with the structure of the frontal bone.

F. C. P.

Microscopical Examination of Dr. Vinsonhaler's Specimen of Episcleral Osteoma.

ALT, ADOLPH (*Amer. Journ. of Ophth.*, Oct., 1906), reports his findings of the above as follows: The sections measured seven by four millimeters on the glass slide. The

tumor consisted mainly of true bone tissue surrounded by a connective tissue capsule similar to bony periosteum. An abnormal number of cellular elements, blood-vessels, leucocytes and lymphocytes were contained in some loose connective tissue on the concave side of the tumor. The bone itself contained many blood-vessels entering at the concave surface and spreading out. These vessels were of capillary formation. Bone-cells were in excess; cartilage was absent.

Alt states that this specimen seems different from others, owing, probably, to the age of the patient. He concludes by suggesting that these tumors are of congenital origin, not the result of an inflammatory process, and not attaining any great size.

F. C. P.

A Case of Transitory Lenticular Opacity in Both Eyes in a Diabetic Patient.

ALT, ADOLPH (*Amer. Journ. of Ophth.*, Oct., 1906), after quoting from literature the opinions of different ophthalmologists upon this subject, reports the following case:

Woman, aet. 28, myopic two diopters, with family history of diabetes, at third term of pregnancy showed trace of sugar in her urine, which disappeared under treatment, although she complained continually, and later there was a dead fetus. Following this occurrence, she lost flesh rapidly and sugar was found in varying quantities. The patient failed to follow directions and the amount of sugar increased.

One day, at 11 in the morning, there suddenly appeared a mistiness, first over the right, then over the left eye, rendering reading impossible. At 5 o'clock Alt made an ophthalmoscopic examination which showed an opacity directly under the capsule, with some radii, a bluish appearance, and covering the pupillary area. The left eye presented six opaque radii with a slight haze between. The fundus in this eye was normal.

The urine at this time contained a very large amount of sugar, the specific gravity being 1,506.

After two weeks' treatment, which the patient now carried out faithfully, there remained only a haze in the right cortex, the left being clear. Both fundi were normal and reading was resumed.

Fourteen months later the patient died in diabetic coma, the eyes remaining apparently normal since the first attack.

Alt's opinion coincides with Heubel's, which assumes that sugar exerts a direct deleterious influence upon the lens. The infrequency of diabetes explains the infrequency of reported eye examinations.

F. C. P.

Melanotic Flat Sarcoma of the Choroid With Unusual Clinical Symptoms.

DRS. DE SCHWEINTZ and HOSMER (*Ophthalmic Record*, January, 1907) give an interesting account of a case of melanotic flat sarcoma with unusual clinical symptoms.

The patient, a woman 42 years of age, whose health had been reasonably good, applied for treatment at the Dispensary of the University of Pennsylvania. For a year prior to her visit to the dispensary she had suffered from severe pain and inflammatory reaction with loss of vision of the right eye; these attacks occurring at intervals of six or seven months, the eye in these intervals being comparatively comfortable; although the vision continued to decline.

Examination showed the vision of the right eye equalled hand movements at one meter. The outer part of the margin of the lid was slightly edematous, the upper and outer bulbar conjunctiva injected and also edematous, tension normal. Filamentous vitreous opacities were visible, a sac-like detachment of the retina, grayish-white in appearance and dotted with small black and brown spots was evident in the upper part of the fundus, and extended to the ciliary region, but did not float into the vitreous; a second detachment in the lower periphery, +8 D., did not show the spots already described. The remainder of the fundus was hazy, the retinal veins distended, disk fairly normal in appearance, but down and in from the latter was a slightly defined pigment mass. There was irregular contraction of the field, particularly on the upper and outer side.

Sixteen days later the eyeball was enucleated, and bisected in the usual manner. Pathologic examination showed a flat tumor mottled from brown to black upon the inner surface of the sclera, and extending from the angle of the anterior chamber to 5 or 6 mm. of the nerve entrance, having a thickness of 2.5 or 3 mm., with almost complete retinal detach-

ment. The tumor involves the chorioid, ciliary body, extreme periphery of the iris, angle of the anterior chamber and the sclera, and consists of a densely packed central portion and loosely arranged peripheral part, the central portion involving the entire thickness of the chorioid, infiltrating the inner layers of the sclera, and pushing forward into the supra-chorioid space. It is composed of closely felted cells, some of which are large, irregular and pigment-bearing. Anteriorly, the structures of the chorioid, ciliary body and root of the iris have been separated by a lymph stasis, the tumor cells have pushed along these separated strands, partially covering them. The posterior portion of the tumor shows the same separation of the structures, the trabeculæ being more uniformly pigmented, and the spaces better filled with cells. The retina is detached, except at the nerve entrance, showing advanced atrophic degeneration. Overlying the tumor is a cyst of the retina, the rod and cone and the nuclear layer being completely obscured. The optic nerve is normal.

Remarkable features of the case are the attacks of neuralgic pain, the edema of the lid, and the localized edema of the bulbar conjunctiva with injection of the overlying superficial vessels.

O. W.

Cysticercus Cellulosæ of the Iris—Operation With Perfect Recovery.

REMBE, REINARD, CHICAGO (*Ophthalmic Record*, January, 1907), gives an account of a successful operation for cysticercus cellulosæ of the iris, the patient being a boy seven years old. When he came under the care of Dr. Rembe his right eye presented the following condition: Edema of the eyelid, hyperemia of the conjunctiva and of the sub-conjunctival tissue, ciliary injection, chiefly around the lower quadrant of the iris, which was discolored, contraction of the pupil, a slightly turbid aqueous humor, the cornea less reflecting and transparent, and a few very small precipitations on Descemet's membrane, but no hypopyon. Near the ciliary region the globe was sensitive to pressure. A tumefaction of the lower half of the iris was visible within the anterior chamber, the tumor extending downward to the region of the sclero-corneal margin, the whole presenting the appearance of a cyst, the upper part transparent, the lower showing

an opaque yellowish body. The color of the iris near the tumor was changed from red to blue; the constricted portion was crossed by radial bands, and similar bands ran over the adjacent side of the tumor from the lower edge of the pupil. Leech-like movements showed in a lateral direction from the cephalic. There was no pain, and very little lachrymation, the vision was fingers at 3 meters, L. E. normal. Instillations of atropin caused the iris to dilate slowly and irregularly. There were posterior synechiæ and the surface of the capsule showed spots, probably caused by adhesions.

At the operation the incision was made centrally rather than peripherally, in order to penetrate the middle of the cyst and thus split the sac. This attempt proved successful, the aqueous humor was allowed to escape, and the cyst walls grasped with a capsule pincette, but the cyst was torn and the contents had to be picked off. The eye was placed under the influence of atropin. The corneal wound healed perfectly, and the anterior chamber was rapidly restored. The eye has practically regained normal vision.

O. W.

Cure of Migraine by Correction of Errors of Refraction.

BAKER, A. R. (*Ophthalmic Record*, January, 1907), gives a tabulated account of 100 cases of migraine headache, 55 of which were cured by the use of glasses, 31 greatly relieved, while those who still continued to suffer with headache, after having been fitted with glasses, continued to wear them, saying they could not do without them.

In the opinion of the writer, migraine is but one of many results of eyestrain. He does not agree with the generally accepted opinion, that migraine disappears at middle age, except in cases of persons who do not use their eyes much, and he asserts that persons with emmetropic eyes may have migraine from eyestrain if they persist in over-use of the eyes. Astigmatism, especially of an oblique axis, he regards as a predominating factor in the production of migraine. Anisometropia, heterophoria and heredity he considers frequent factors.

O. W.

Operation for Secondary Cataract Embedded in the Vitreous.

DENIG, RUDOLF (*Ophthalmic Record*, January, 1907), makes some very interesting remarks on operation for secondary cataract.

Referring to the site and size of a possible tear of the hyaloid membrane, the quality and quantity of the escaped vitreous, the condition of the remaining cortex and any inflammatory process which may have set in after the operation, the writer says, as in small tears only a small quantity of the vitreous escapes, there is a possibility of the tear closing spontaneously. The vitreous which has entered the anterior chamber may gradually disappear, and the conditions for a secondary operation be favorable. In larger tears this possibility is more remote unless occlusion is created by iritic exudation. The region of the fossa patellaris has a peculiar tendency to rupture, but in many cases the tear may be in the periphery, and may be caused by an injury of the hyaloid by an instrument. In other cases tears caused by changes in the zonula fibers may sometimes favor a peripheral rupture of the hyaloid.

In case of the fossa patellaris becoming torn, if the tear is large the anterior chamber becomes very deep, and in case of an iridectomy the pillars of the coloboma will stand wide apart; at the same time the inferior edge of the pupil is raised, the symptoms being in proportion to the size of the tear. There is free communication between the vitreous and the anterior chamber, and cortical remnants are embedded in the vitreous substance unless iritic exudates have produced occlusion. The consistency of the vitreous is of great importance, there being less *vis a tergo* in the liquified vitreous of a degenerated eye than in normal vitreous substance. The consistency of the cortical remnant is also very important.

Vitreous puncture has frequently been performed as a routine operation (after extraction of cataract and dressing the wound) by introducing the cystotome into the center of the pupillary region and tearing down the fovea patellaris corresponding to the posterior capsule, thus reducing the number of secondary cataracts. In consequence of the soft consistency of the cortex, the lenticular remnants easily mix with the escaped vitreous and are rapidly absorbed. It is possible that rapid agglutination of the anterior and posterior capsules may occlude a quantity of cortical substance sufficient to prevent absorption. In the case of cataracts of a brownish-yel-

low or light brown color with a tough paste-like cortex, absorption is slow and uncertain.

A simultaneous tendency to adhesion between the iris and the capsule through cortical masses adherent to the capsule, and unmixed with vitreous substance, will cause irritation of the iris and create a bridge over which the iritic vessels spread to the capsule, thus favoring secondary cataract. When the secondary cataract is embedded in the vitreous and there are no iridocyclitic processes the cataract may recede from the knife or shift with the needle. This possibility is more remote where the vitreous humor is normal and the capsule adheres to the iris.

Incarceration of the vitreous body in the wound can be averted by introducing the knife into the anterior chamber through the limbus.

The writer differentiates between the forms of secondary cataract, as thick and thin with normal consistency of vitreous fluid, and thick and thin with liquified consistency of vitreous fluid, and membranous tough secondary cataract caused by iridocyclitic processes with adhesion to the iris, and pupillary occlusion in liquified vitreous substance. O. W.

The Ocular Lesions of General Arteriosclerosis.

MARPLE, W. B., NEW YORK (*Medical Record*, March, 1907), in an illustrated and exceedingly interesting article on the Ocular Lesions of General Arteriosclerosis, describes the various ophthalmoscopic signs of arteriosclerosis as follows:

A general change in the size of the arteries and veins of the eye-ground. The narrowing of the arteries may be slight in the early stages, or in marked cases so extreme as to almost suggest atrophy of the optic nerve, particularly where there is pallor of the disk. The apparent diminution in size of the arteries is associated with changes in the coats which have narrowed the blood stream. Irregularity of caliber is caused by the disease affecting some parts of the artery more than others, and this condition has indicated arteriosclerosis in other parts of the body. As the arteries narrow, the veins frequently appear to be, and in many cases are, relatively dilated; this dilatation occurring in about 50% of all cases.

In sclerosis of the aged the veins are apt to be larger on the average in the periphery than in the vicinity of the papilla, and on the latter, with this narrowing of the arteries, a tortuosity of certain small arterial branches, especially in the vicinity of the macula, may appear, while the larger vessels from which these very tortuous branches arise are normal. The corkscrew arterial twigs usually appear in the early stages of the condition; tortuosity not being likely to appear in very advanced cases.

The central light streak of the arteries is broader, and of increased distinctness, the whole surface of the vessel being of a lighter color than normal. The secondary and tertiary branches of the central artery being mainly affected.

These are "silver wire" arteries, and their appearance is due to the higher reflecting power from the arterial wall after it has undergone a hyaline or fibroid change.

The most characteristic phenomenon is that of changes in the caliber of the vessels at different points, usually where a vein is crossed by an artery (the vein being depressed as though a wire were laid across it).

Among the visible changes in the vascular walls of the retinal vessels are white lines along parts of some vessels, arteries, or veins.

Angiosclerosis is not confined to elderly people. Cases have been seen in persons under thirty years. It occurs more frequently in men than in women. The central vessels, those nearer the optic nerve, are most apt to be affected.

In the opinion of the writer, ophthalmoscopic examination is one of the most ready means for the early detection of important arterial changes. O. W.

Pulsating Exophthalmos—Ligation of Orbital Artery—Recovery.

LEWIS, F. PARKER (*Ophthalmic Record*, February, 1907), reports a case of unusual character.

The patient, a working man twenty-five years old, had received a blow on the back of the head which rendered him unconscious, and from which he suffered for several weeks. He then noticed a fullness in his left eye and a sensation of beating in his head, which continued for a year before he applied for treatment. At that time the eye protruded down-

ward and outward, the displacement being forward 10 cm., outward 6 cm., downward 2 cm. He had heteronomous diplopia. The eyeball was highly injected, pupillary action normal, with slight fullness of the retinal vessels. A marked bruit could be heard over a space an inch in diameter at the inner orbital angle. Vision in both eyes was 20/30. A tense pulsating tumor was perceptible through the upper lid. He was almost in a state of nervous terror, with rapid pulse, flushed face and voice tremulous.

The case being evidently an aneurism of the ophthalmic artery which seemed to involve but one vessel, it was decided to ligate it without removing the eye. Under a profound anesthesia the lids were widely opened. A careful dissection showed that the artery had curved upon itself, the largest portion having the diameter of a man's little finger. The eyeball being diverted to the temporal side, the tumor was found to extend backward, the diameter lessening until it wound around the optic nerve near the optic foramen. Several ligatures were placed around the enlarged vessel until the artery was tied off within the orbital cavity. The tissues were then coapted and retained by sutures. Ice-bags were applied and healing took place without reaction. The bruit and proptosis disappeared, but some divergence remained. Three years later the patient was seen; both eyes were apparently normal. The disk of the left eye showed a slight paleness, vision in both eyes equal and the same as when first seen, a slight normal deficiency being present.

Interest in this case centers in the fact that although a portion of the aneurism extended outside the orbit, a ligature within controlled it. O. W.

Chalazion Forceps.

BOETTCHER, HENRY M. (*Ophthalmic Record*, February, 1907), comments on the tendency of cystic tumors (chalazia) to re-form after operation for removal has been done from the conjunctival surface, and describes a forceps he had made, the use of which he claims prevents re-formation of the tumor by removing a portion of the cyst wall; thus establishing perfect drainage and allowing the cavity to fill with granulating tissue.

His method is as follows: A 10% solution of cocain is instilled three times in ten minutes, the tarsus is then everted and a chalazion clamp applied, except for tumor of the upper lid, when the left thumbnail can be slipped under the tarsus, the lid being held in place by the forefinger. This prevents hemorrhage by compressing the lid; it also causes the tumor to come forward, and is less painful than when a clamp is used. A horizontal incision in the lower third of the tumor is then made, the narrow blade of the forceps inserted and a portion of the tumor punched out. A thorough curetting is all that is necessary; the writer has never seen a tumor re-form after it had been removed in this way. O. W.

A New Instrument.

BEARD, CHARLES H., Chicago (*Ophthalmic Record*, February, 1907), describes a new fixation forceps which he has invented.

This new instrument is intended to relieve the hand of the operator from the awkward bend necessitated in the use of the old forceps, the bend being given to the instrument by having the blades set at right angles to the way in which the blades of the old forceps were set. It is so constructed that when applied to the eye the body of the instrument assumes a vertical position; thus affording a comfortable, convenient position for the hand of the operator. It is adjusted for use on either eye, and its roughened finger-holds render it more secure in the grasp of the operator. O. W.

Certain Affections of the Optic Nerve.

GUNN, R. MARCUS, F. R. C. S., London, Eng. (*Ophthalmology*, January, 1907), says that of all the cranial nerves the nerves of vision are by far the most readily involved in disease, because: 1st. They may be regarded as forming part of the central nervous system developmentally and anatomically, and thus the optic nerve often suffers as an integral part of the central nervous system. For example, in the late stages of syphilis, atrophic changes occur, sometimes in the posterior roots of the spinal cord, sometimes in the fibers of the optic nerve, occasionally in both together. In tabetic degeneration, the reflex collaterals of the cord are first affected

and later the other fibers; in like manner in the visual apparatus the loss of the light reflex (the reflex fibers being considered as probably collaterals from the visual fibers) is one of the earliest and most common symptoms of this kind of late syphilitic poisoning. The same relation may be demonstrated by several anatomical analogies between the optic nerves and the posterior spinal roots, in the disposition of their sheaths and in their minute structure and by the effect of toxins and poisons like tobacco, ergot, pellagra and in beri-beri. Similar relations are found in the general paralysis of the insane, and in insular sclerosis. 2d. The optic nerve, throughout its entire extracranial course, is enveloped by sheaths which are a direct prolongation of the meninges and the spaces between the sheaths are continuous with the spaces between the meninges of the brain, and contain the same fluid. The explanation by Graefe, fifty years ago, of the relation between optic neuritis and tumors of the brain, still remains practically as he left it. The important fact that the intermeningeal spaces around the brain were directly continuous with the intervaginal spaces of the optic nerve, first demonstrated in 1869 by Schwalbe, was naturally regarded as significant, as it gave an explanation of how an extension of pressure from the meningeal spaces of the brain to those of the optic nerve might easily occur. This pressure is particularly liable to affect the nerve fibers while in the optic canal, and while passing through the scleral aperture. In a papillitis in connection with high intracranial pressure the changes are such as we would expect from such transference of pressure. We have a swelling of the intraocular end of the nerve, accompanied by distension of its small vessels, edema, the vena centralis not engorged in the earliest stage, no visual failure such as we should expect in an ordinary inflammation of the nerve, disappearance of the papillary edema without visual failure on early removal of the cranial pressure. Anatomically, we have distension of the cerebral ventricles, escape of the fluid into the subarachnoid space of the brain and spinal cord, fluid distension of the intervaginal space around the optic nerve, edema of the papilla, separating and displacing but not actually destroying the nerve fiber bundles. 3d. The position of the intracranial nerves at the base of the brain

renders them prone to suffer in inflammations of the basal meninges and liable to be damaged by direct pressure. 4th. After its entrance into the optic canal, the nerve has, for the rest of its course, all the exposures of a peripheral nerve. 5th. The optic nerve fibers may degenerate, secondarily to destruction or impaired nutrition of the ganglion cells in the retina. 6th. The optic nerve may suffer from an extension of an ocular inflammation. 7th. The optic nerve may suffer from a general influence produced by serious disease, e. g., the obstructive effect of a thickened arterial wall pressing upon a vein may explain many cases of circumscribed edema or hemorrhage, and probably the result seen in renal disease, of obscure anemia and of blood changes produced by great loss of blood, and as a result of febrile disease, are due to changes in the relation between the blood and the vessel walls and a lowered nutritive state of the surrounding tissues. A. F. A.

Extraction of Cataract Within the Capsule by External Manipulation.

GREENE, D. W., Dayton, Ohio (*Ophthalmology*, January, 1907), writes that this method of extraction, having been practiced with varying success since 1775, and strongly advocated by Pagenstecher and Sperino, is now mostly reserved for certain forms of hypermature cataracts and for those in which, when the corneal section is completed, loss of vitreous is threatened, when the anterior leaf of the capsule is very thick and opaque, or when the cataract is of the slowly ripening, nuclear form. After tabulating twenty-two cases, the writer concludes that the loss of vitreous and incarceration of the iris are the chief dangers; the percentage of first-class results in this and other writers' experience is disappointing; that the operation is too difficult for those of ordinary experience and the coloboma is often unsightly. A. F. A.

Occlusion of a Branch of the Central Artery of the Retina.

KEIPER, GEO. F., Lafayette, Ind. (*Ophthalmology*, January, 1907), reports in full a very interesting case of a woman of 19, who complained of failure of vision in the left eye. The ophthalmoscopic findings were negative, but there was a large, irregular, absolute scotoma for white, with irregular color fields. Five days later, corresponding hemorrhages were

found. All of these conditions improved under deep massage. The essential point of the case is that the field of vision showed a scotoma before its cause became visible by the ophthalmoscope, that is, the perimeter diagnosed the condition before the ophthalmoscope. A. F. A.

Obstructive Disease of the Retinal Vessels.

REBER, WENDELL, PHILADELPHIA, PA. (*Ophthalmology*, January, 1907), gives a thorough discussion of the role of arterio-sclerosis in various obstructive diseases of the eye, and declares that arterio-sclerosis seems to be the starting point of most diseases of the retinal vessels, whether due to the necessary changes of old age or one of the commonest sequences of a strenuous or disordered life, manifesting itself by alteration in the course, caliber or structure of the wall of the vessels, in small hemorrhages or in complete blocking. Many illustrative cases are reported at length, some which show the beginnings of arterio-sclerosis in the ocular vessels before the cardio-vascular system shows signs of structural changes. The relation between transient monocular blindness from spasm of the ocular vessels and arterio-sclerosis, possibly followed by arterial thrombosis, is discussed with an illustrative case. Several cases illustrative of thrombosis and embolism, due to changes in the vascular walls, are described at length, and the relation between glaucoma and vascular changes is mentioned. A. F. A.

On Some Ocular Symptoms Common to or Produced by Affections of the Nose and Accessory Cavities.

WOOD, CASEY A., Chicago, Ill. (*Ophthalmology*, January, 1907), emphasizes the well-known fact that many conditions of the eye may be caused or aggravated by disorders of adjacent cavities. He mentions headache, vertigo, lachrimation, blepharitis, paresis and paralysis and asthenopia, and describes some differential characteristics between them. A. F. A.

ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

(Great Britain and the English Colonies.)

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Ring Scotoma.

HANCOCK, W. ILBERT (*Royal London Ophthalmic Hospital Reports*) presents three cases of ring scotoma with a brief analysis of the theories which have been advanced to explain such scotomata, together with a consideration of the diseases and conditions in which they are met, and a study of the three cases with the author's conclusions as to the pathological etiology of ring scotomata in general.

Case I. Developed a ring scotoma of the left eye after a lightning-stroke; field presented giving a ring scotoma mostly covering the area between 30 degrees and 40 to 45 degrees. Form fields normal. V. in affected eye 6/60. Other eye 6/6. Field normal. Fundus O. U. negative.

Case II. Ring scotoma following failure of V in O. D. for previous six weeks. V. O. D. moving shadows. O. S. 6/6. Field O. D. Large central scotoma. O. S. normal. Fundus: Slight paling disk O. D. O. S. normal.

Five months later, field O. D. ring scotoma from 3 to 10 degrees. Form fields normal. O. S. Still normal.

Fundus O. D. marked paling of disk. O. S. normal.

Case III. Eight years' duration; worse last two. Night blindness O. U. V. O. D. 3/60. O. S. 6/60. One brother also affected. Fields: Absolute ring scotoma O. U. between 10 and 30 degrees. Fundi typical retinitis pigmentosa sine pigmento.

The theories mentioned as to causation are:

- a. Lesion of retinal vessels about the macula.
- b. Anatomical arrangement of venæ vorticosæ at ocular equator.
- c. A circular exudation of the chorioid.
- d. Impaired function of retinal rods demonstrated in all cases of night blindness.
- e. Equatorial belt situated at juncture of anterior and posterior chorioidal circulation, changes in capillaries of which would explain.
- f. Retro-ocular lesions of nerve.

The author dismisses the first three as already proven untenable and follows with a list of conditions in which ring scotomata are found which he gives as follows:

1. Retinitis pigmentosa.
2. Retinitis, chorioiditis, and retino-chorioiditis.
3. Lesion of optic nerve.
4. Glaucoma.
5. Idiopathic night-blindness.
6. Myopia.

He then considers the three latter theories as applied to each of these conditions, and observes:

1. In retinitis pigmentosa, the scotoma does not correspond to the equatorial retina, and that the outline is too regular to admit of the etiology of vascular changes.

2. In many cases, the retinal scotoma as seen in retinitis, chorioiditis, etc., does not correspond to the retinal lesions which may grow worse while the ring disappears. This eliminates the theory of rod causation, and Hardmann reported a case of syphilitic retinitis, in which there was a ring scotoma in the right eye between 5 and 30 degrees, and in the left, an absolute crescentic scotoma between 20 and 30 degrees around upper half of macula, which disposes of arterial etiology in this class of cases.

3. Ring scotomata are seen in retro bulbar neuritis without retinal changes.

He gives a case reported by Burnett, where the character of the fields, in which there was hemianopsia, a ring scotoma O. D., partial ring scotoma O. S., which, together with the history, showed the lesion to be either in the tract or chiasma. He also quotes a case reported by de Schweinitz presenting ring scotomata between 10 and 30 degrees. In neither case were there fundus lesions.

4. Glaucoma rarely presents ring scotoma; only seven cases reported, but a case by Handmann is given in which in O. D. there was a ring scotoma between 10 and 30 degrees. The author believes pressure on the nerve fibers would best of all account for such a scotoma.

5. Idiopathic night blindness. He knows of no reliable report, but quotes a report of Heinrichdorf of 11 cases of ring scotoma in various conditions, but concludes that as the author gives too meagre a description of his cases, and does not explain the causes of this form of scotoma, the value of this report is difficult to decide upon.

6. Myopia. There are few references to the subject. Weiss has described cases and Wettendorfer in a lengthy paper concludes that a careful examination of all myopias above 6 D. will show with a 5 mm. object, relative or absolute negative ring scotomata, either including the blind spot, or situated peripherally, which are entirely independent of fundus changes. No other observer has verified these results.

Then follows a consideration of the three cases the author reports. The first he believes to have been an optic nerve lesion due to the lightning. The second was a central scotoma involving the macular region, in the center of which a clearing up gave the ring characteristic seen in the later fields. The third, retinitis pigmentosa, he believes disproves the equatorial vascular theory in regard to the disease.

In his summary, the author excludes the scotomata found in glaucoma, idiopathic night blindness and myopia as requiring further verification, and divides the remainder of cases into:

- a. Those in which the retina or chorioid is diseased.
- b. Those in which there are no fundus changes.

An extra or intro-ocular hypothesis explains these groups. Those favoring the intro-ocular theory ignore the cases presenting a normal fundus.

The extra-ocular theory is favored by the author. This theory he believes is proven by cases of retro-bulbar neuritis without fundus changes of retino-chorioiditis where the scotoma does not correspond to the site of the lesion. The cases of hemianopsia of Burnett and de Schweinitz illustrate this retro-bulbar class.

He quotes Lister, who points out that his microscopical studies of retinitis pigmentosa show, that there is no sclerosis of the chorioidal arteries and that the concentric defect corresponds with nerve distribution rather than vascular distribution, concluding therefrom that the degeneration commences primarily in the nervous tissues.

The arrangement of the optic nerve fibers and of the macular bundle with their retinal distribution, the author believes gives added strength to the extra ocular theory. W. R. P.

A bibliography is annexed.

Acute Streptococcus Infection of the Conjunctiva.

MR. ARNOLD LAWSON (*The Lancet*, Feb. 16, 1907), reported before the Ophthalmological Society a case of acute streptococcal infection of the conjunctiva in a child aged 16 days. For the first few days of the infection, the symptoms were of a moderate nature, consisting of a slight muco-purulent discharge with some swelling of the lids. After about ten days, the cornea of each eye became suddenly infiltrated and the case then ran a very rapid and acute course. A tough tenacious membrane formed over both lids and the bulbar conjunctiva of both eyes. Within 36 hours from the onset, the sight was hopelessly destroyed. The sloughs began to break down about three weeks after the first symptoms of infection, and both corneae had perforated some days before this. The child's health was never affected throughout the disease. Swabs taken from the conjunctival sac showed a very nearly pure culture of the streptococcus pyogenes. Treatment was of no avail. Mr. Lawson also presented a second case aged six years, convalescing from scarlet fever, who was then attacked with measles. Ten days after the onset of the measles, the temperature became very high

and assumed a fluctuating type, as seen in pyæmia. At the same time, lids began to swell accompanied by little or no discharge. After a few days the discharge began to increase and the cornea suddenly became infiltrated. Within 24 hours of this infiltration being noted, the condition of the eyes was hopeless, and both corneae rapidly perforated. Bacteriological report showed that infection was a mixed one and due to streptococcus pyogenes and staphylococcus pyogenes aureus. W. R. P.

Silkworm Gut. Lacrimal Style.

J. BURDEN-COOPER, M. D., F. R. C. S. E., Bath (*Ophthalmic Review*, January, 1907), described a silkworm-gut lacrimal style. A piece of gut of moderate thickness is clamped at one end, and in the middle, by artery forceps, and these are turned in opposite directions, so as to twist the gut. The extreme end of the twisted part is flattened and pierced by a fine needle threaded with silk. After cocainising inner canthus and nose, a small sponge to which the silk thread is attached is placed in the nose to prevent the silkworm gut passing into pharynx. The lower canaliculus is slit, and a silver probe passed in the ordinary way. This is followed by Galezowski's dilator. After dilation, the style is inserted. The gut is grasped by dressing forceps and by steady pressure, forced into the duct. It is grasped at the end of the duct and drawn through. The upper and lower ends may be tied on the cheek or the gut cut on the cheek and the upper end burnt by means of a hot needle, and a small knot of sealing wax fixed to it. The upper end of the style is bent to a right angle, the short horizontal part lies in the slit canaliculus when the style is drawn into place. The lower end, after having a knot of wax fixed to it, is inserted within the nostril.

In introducing a silk style, the modified gut style described above, is used. The loop is threaded with moderately thick silk, and the style is drawn through, carrying the silk with it. By using the silk double, or in loop form, the silk style can be changed daily. The canaliculus is slit in such a way as to leave a portion near the puncture intact, and to this ring of tissue is fixed the loop. The cases par excellence for flexible styles are those in which there is a limited lesion near the lower end of the nasal duct, and in the early stages of disease extending from the nose upwards. W. R. P.

Affections of the Lacrimal Apparatus.

SYDNEY STEPHENSON (*The Lancet*, February 9, 1907), gives a detailed description of the lacrimal apparatus, reports cases of congenital absence of tears, and reviews the pathological conditions which the lacrimal system is subject to. He says congenital absence of the tears has been reported. In a striking case of the kind by Sommer in a child aged two and one-half years, no weeping followed either the infliction of a severe burn or the subsequent painful dressings. In a case by A. S. Morton there was an absence of tears as regards the right eye only, due, he thought, to a congenital absence of the gland.

Sanguineous lacrimation is another curious condition mentioned. A recent example is that reported by Cross. In his patient, a woman, aged 21 years, the bleeding took place periodically from one eye, and when he reported the case it had been going on for 18 months. Some of the cases of so-called "bloody tears" are doubtless but examples of vicarious menstruation, although it must generally remain uncertain how far the blood comes from the lacrimal gland and not from the conjunctiva.

The author thinks cases of dacryoadenitis are more common than is generally thought. The symptoms of acute inflammation of the lacrimal gland are pain, tenderness and swelling in the upper and outer part of the orbit. In marked cases, the eyeball may be forced forwards, downwards and inwards and the chemotic conjunctiva of the superior fornix may project as a flesh like fold between the lid and the globe. The inflammation may terminate in resolution or in suppuration. When acute dacryoadenitis is bilateral, it is usually the outcome of general infection, such as may be met with in mumps, gonorrhoea, measles, influenza or erysipelas. Cases published by Lagrange and by Casali respectfully, appear to show that amenorrhoea may sometimes give rise to dacryoadenitis.

W. R. P.

An Analysis of a Series of Consecutive Conjunctivitis Cases.

BY C. H. USHER AND HENRY FRASER, ABERDEEN.

Under this title as reported in the *Royal London Ophthalmic Hospital Reports*, the authors give a most interesting and instructive series of observations extending over a sufficient period, and comprising enough cases to give valuable data

from which to draw conclusions as to the value of clinical versus bacteriological diagnosis, and of the relative frequency of the various forms of organisms to be found in conjunctivitis together with various other observations.

For purposes of comparison, a schedule was filled at the time of examination, giving history and important details of each case.

Cases due to injury or lacrimal disease were excluded.

The routine practice was to take a culture and a spread from each case. In cases of doubt, a second smear was frequently taken, the first being stained with Löffler's methylene blue, and this proving insufficient, the other stained by Gram's method.

The best culture medium in these experiences was 2.5% agar mixed with equal parts of Ovarian Fluid.

Examination showed this ovarian fluid to contain from 5 to 7.5% albumin and traces of blood coloring matter.

There were 820 cases of conjunctivitis examined, the same being 23.24% of all eye cases treated during the time of observation.

In two series of statistics quoted, comprising nearly a million cases, the relative frequency was 28.5 to 30% of all cases.

KOCH-WEEK'S BACILLUS CONJUNCTIVITIS.

Of the 820 cases examined, 310 were bacteriologically proven to be Koch-Weeks infection. There were 268 cases diagnosed as due to Koch-Weeks bacillus that were shown to contain this bacillus of which 26 cases contained also the diplobacillus.

Of those so diagnosed but not confirmed, there were 78 cases. Of cases wrongly diagnosed as diplobacillus, but proven to be bacteriologically, Koch-Weeks, there were 42. Nearly 55% per cent of cases occurred between the ages of 5 and 13. Over 25% under 5 years or 89% under 14 years and nearly 20% in those 14 or over.

The majority of cases of Koch-Weeks infection had been of short duration, 6-8 days. Some cases had a history of 2 or 3 weeks. There were a very few that had existed from 1 month to 1 or 2 years.

Most of those of long duration were found to have also the diplobacillus present.

About 10% had had a previous attack. In 70% of cases others were affected in the same house or family, and in about 25% more, there were cases in the vicinity.

Ninety per cent. showed increased redness of both ocular and palpebral conjunctiva.

In 56% there was a moderate discharge; it was scanty in 38% while in 6% it was profuse. Its character was always muco-purulent. Nearly all the cases showed swelling of the lids; in about 21% there was conjunctival hemorrhage and in nearly 15% the conjunctival follicles were enlarged. Chemo-sis was noted twice and a membrane on the conjunctiva four times.

In those cases complicated by phlyctenules, the staphylococcus was present in the majority while in others were found less commonly the diplobacillus, streptococcus or xerosis bacillus. The subjective symptoms were of little or no value in diagnosing Koch-Week's infection. No case of this bacillus was found in patients over 50 years of age.

About 12% had the disease in one eye only. A clinical diagnosis may be attained in the majority of cases by considering:

1. Age, childhood and adolescence.
2. Short period since onset.
3. History of other cases.
4. Ocular conjunctiva involved.
5. Moderate muco-purulent discharge.
6. Conjunctival hemorrhages.
7. Cases from rural districts most unlikely to be affected with Koch-Week's.

BACTERIOLOGY.

In making cultures, it was proven important that the interval between taking and placing in the incubator should be as short as possible, an hour or two being disadvantageous.

Colonies of Koch-Week's were markedly inconspicuous unless associated with some other organism.

In 232 cases, cultures of the Koch-Week's bacillus were positive, in the remaining 78 cases, it was diagnosed from the film alone. In only 13 cases where the film was negative, did cultures prove positive. Thirty-two cases were positive from culture alone, no film having been taken.

When culture failed, it was generally due to imperfect media.

DIPLOBACILLIARY CONJUNCTIVITIS.

There were 274 out of 820 cases proven positive bacteriologically.

In regard to age of patient, the organism was more frequent in childhood and in adult life in the third and fourth decades. Seventy-seven per cent. of cases occurred in adults, 23% in children. Over 50% had a history of one month or longer. Less than 40% had a duration of one week or under.

About 28 % had had previous attacks. The bacillus was found in one case over 7 months after it had been shown to be present.

In 22% of cases, others were affected in the same house and in 5% in the vicinity.

About 50% showed ocular and palpebral conjunctiva injected; the remainder ocular alone. In nearly 80% the discharge was scanty. In less than 20%, it was moderate and in only one case was it profuse. It was in all cases muco-purulent. Sixty per cent. showed swelling of the lids and about 11% enlarged conjunctival follicles. Of hemorrhage there were but two. There was in no case chemosis or a membrane present.

About 35% of the diplobacillary cases had an angular conjunctivitis affecting the margins of the lid at the outer or inner canthus which, when present, is strong evidence of its existence as this organism was found in nearly 90% of all angular cases. About 10% were uniocular. Nearly 90 were binocular.

Corneal ulcers were present in 6 cases and phlyctenules in but four cases.

Clinical diagnosis is not aided more by subjective symptoms in diplobacillus than in Koch-Week's conjunctivitis. Some gave no subjective symptoms at all but came for other conditions. Sixteen cases complained of heaviness of lids.

Age plays an important part, 72% of cases being over 14, though 28% occurred in children under 14, showing that it is not infrequent in children. In adults, over 40, the diplobacillus predominates over every other form.

About 25% had had previous attacks. Others are affected less frequently in the same house and vicinity than in Koch-

Week's cases, but sufficiently often to indicate the infectious nature of the disease.

Ocular redness is less common than in Koch-Week's, though this is not so marked in children. Enlarged follicles are less frequent, and swelling of the lids was less than in Koch-Week's. The clinical diagnosis therefore should be based upon:

1. Angular conjunctivitis.
2. Age.
3. Duration.
4. Congestion more commonly palpebral.
5. Scanty discharge.
6. Absence of conjunctival hemorrhage.
7. History of previous attacks.
8. Complaint of heavy lids.
9. More common in rural districts.

In the series of 820 cases, 9 diagnosed as due to the diplobacillus were bacteriologically shown to contain pneumococcus.

BACTERIOLOGY.

The authors note the relatively large number of diplobacillus to the number of cells. Good films may be secured by merely running the loop over the caruncle and vicinity when the discharge is scanty. The number of bacilli present are not proportional to its amount of discharge. When present in small numbers and the xerosis bacillus is present, also differentiation may be made by Gram's method, the diplobacilli being unstained by this stain.

Cultures after 48 hours produce frequently large colonies, displaying a pronounced central mammilla, with greyish semi-transparent area surrounding, which are characteristic. In older cultures involution forms are constant. It will liquify serum culture media.

In 15 cases, the film was negative, as also in 12 cultures. In 223 cases, films were positive, of which 19 films only were taken. Two hundred and twenty-four culture cases positive, of which in 44 cultures only were taken.

GONORRHOEAL CONJUNCTIVITIS.

Of the 820 cases, 18 were bacteriologically shown to be due to the gonococcus. In no case were gonococci found which was not diagnosed as purulent ophthalmia.

Cases were all infants from 3 days to 2 months old. The organism was found in every instance, in the film. In the 18 cases 14 cultures were made and all proved positive. Ovarian-agar was particularly satisfactory and an indefinite number of sub cultures could be obtained with ease.

After 48 hours incubation, the colonies were well marked, greyish, rounded, elevated and semi-transparent.

TUBERCULAR CONJUNCTIVITIS.

There was but one case in 820. Patient gave history of swelling and redness with gumming of eyelids for three months.

Scrapings taken and films made from the diseased conjunctiva were stained for tubercle bacilli. A single tubercle bacillus was found.

A guinea-pig inoculated with some of the affected tissue showed tubercular infection in the spleen, liver and lungs and the inguinal glands were enlarged. Tubercle bacilli was found in numbers in the diseased tissues. A rabbit inoculated from the patient's conjunctival tissue developed generalized tuberculosis.

The conjunctiva was scraped and cauterized and five months later, save for a scar, the eye was well.

DIPHTHERITIC CONJUNCTIVITIS.

This was seen but once. Palpebral and ocular conjunctiva congested, muco-purulent discharge. In left eye, membrane extends over whole of palpebral conjunctiva. On removal, conjunctiva presented greyish appearance: films and culture were both positive. From the culture a guinea pig was inoculated which succumbed in 48 hours.

The membrane extended to the upper lid also when anti-toxin was administered, followed by an uninterrupted recovery.

Cases in which no microorganisms are found. Some of these had marked conjunctivitis.

PNEUMOCOCCUS.

In 24 cases diplococci were found unassociated with Koch-Week's or diplobacillus. Fourteen of these resembled clinically a Koch-Week's infection, the other 10 a diplobacillus con-

conjunctivitis. The author concludes a clinical diagnosis is impossible.

The diplococcus found gave as characteristics:

1. A capsule in the films.
2. Dew drop colonies on ovarian agar larger than the Koch-Weeks from which films showed a diplococcus staining by Gram's method. Inoculation in mice gave post-mortem an encapsulated diplococcus in the organs.

Thirty-four cases of lacrimal discharge examined gave 25 cases of a diplococcus similar to the one described. In 18 inoculations from these cases on mice the majority of the animals died in which the capsulated diplococci were found, though not invariably in the beast's blood and spleen. They conclude that this part of the examination was unreliable.

Trachoma was not included.

The great majority of Koch-Weeks infection came from the towns and villages.

In 94 rural conjunctivitis cases there were found:

Diplobacillus	44
Gonococcus	1
Pneumococcus	6
Tubercle bacillus	1
Koch-Weeks	2
Koch-Weeks with diplobacillus	2
No organism	2

Staphylococcus, streptococcus, xerosis, etc., were found in the remainder.

The authors dwell on the absence of Koch-Weeks infection in cases from rural districts, and would be interesting to note the experience of other observers in this respect. To explain the rarity, the authors quote Erdmann, who found that diplobacillus conjunctival discharge would remain alive on linen in room temperature 14 days. In their own experience a culture could be obtained after 4 days which they state is in marked contrast to the behavior of the Koch-Weeks bacillus.

They note an increase of cases in Spring and Autumn. The Spring rise seemed to have been caused by the diplobacillus and the Fall by the Koch-Weeks bacillus. However, as these Koch-Weeks from which films showed a diplococcus staining

their value as evidence can only be apparent when compared with a number of other years.

They observe that the greater the rain fall, the fewer the cases of conjunctivitis.

They conclude from their study:

1. That Koch-Weeks and diplobacillus cause the great majority of conjunctivitis cases, the former somewhat predominating. They express their belief that of those that were not examined for organisms (about 14 cases) the majority were also one of these forms. They were not examined bacteriologically because, for various reasons, the conditions present made the isolation of a specific organism unlikely, the case having been modified by improper treatment or a good history being impossible to obtain.

2. In Koch-Weeks bacillus 235 out of 284 cases were under 14. Twenty-one per cent. showed conjunctival hemorrhages—no case came from rural districts.

3. In the 310 cases of Koch-Weeks infection, the diplobacillus was found in 36.

4. Recurrent attacks are caused more often by Koch-Weeks.

5. In the majority of cases a correct clinical diagnosis of this variety can be made.

6. Cultures of Koch-Weeks can be readily obtained on ovarian agar.

7. Citrated or blood agar is even better than ovarian agar.

8. In the diplobacillus, the angular conjunctivitis is important in making a diagnosis.

9. Twenty-eight per cent. diplobacillus occurs under 14. Seventy-two in those over this age.

10. Clinical diagnosis is possible in 70% of cases.

Cultures of diplobacillus grow readily on ovarian agar.

11. Pneumococcus can not be clinically determined.

12. In infants under one year, Koch-Weeks is most common, next in order, gonococcus and then diplobacillus.

13. No definite climatic influences were demonstrated.

To condense this valuable article of over 60 pages has been a difficult task and much that is interesting has necessarily been excluded.

W. R. P.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

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Pneumatic Massage, a New Therapeutic Measure in Ophthalmology.

DOMEC. (*Die ophthalm. Klinik*, No. 22, 1906.) The cup which is applied to the eye resembles an eye cup, is elliptical in shape with concave margins in order to snugly fit over the eye. Domec exhausts the air with each inspiration of the patient, exercising 50-200 tractions at a sitting. In nervous asthenopia, in several cases of glaucoma and in one infectious case associated with severe pain this method proved to be a means of alleviating pain. It can be employed as a preliminary measure to pressure massage or as a substitute for the latter. The analgesic action he attributes to probable traction on the ciliary nerves.

A. C. S.

A New Instrument for Lighting Deep-Seated Vessels.

BIRCH-HIRSCHFELD. (*Münch. med. Woch.*, Nov. 13, 1906.) Birch-Hirschfeld describes an instrument for ligating vessels in the orbit and other regions when ligation by the ordinary

method is impracticable. The article is illustrated. The instrument consists of a hemostatic forceps to which a sliding ligation-carrying device is attached. From this ligation holder is suspended a loosely tied ligation loop encircling the blades of the forceps. The ends are made taut to a bracket near the handle of the forceps. After clamping the vessel, the knob of the ligation holder is depressed, thus conveying the loop over the vessel at the same time tightening the knot. The instrument is made by Schaedel of Leipzig. A. C. S.

Two Ocular Complications Caused by Malaria.

BARGY. (*Die ophth. Klinik*, No. 22, 1906.) The first one, retinal hemorrhages associated with hemorrhage into the vitreous concerned a private in the French colonial service who had contracted the quartan type of fever in Madagascar. The eye symptoms, however, did not occur until 21 months after the last malarial attack. Under quinin, atropin, etc., vision slowly returned to 1/5. The other eye remained normal.

The second complication affected an officer who had been in the colonial service off and on for over ten years during which he had several attacks of malaria. The ocular condition, ushered in by neuralgic symptoms of the trigeminus, characterized itself by an acute hyperemia of the anterior ocular segment. The media remained clear, although the patient complained of cloudy vision — $V = 3/5$ (old maculae corneae). Similar attacks recurred every four weeks. Quinin was then administered, preventing further paroxysms during the next $4\frac{1}{2}$ months when corneal infiltration and ulceration appeared. These symptoms were of brief duration and in a week the eye returned to normal.

He ascribes the ocular disturbances to that insidious form of malarial fever—malaria larvata—and attributes the uniocular involvement to the fact that scar tissue (macula corneae) is less resistant to infectious processes than healthy tissue.

A. C. S.

Results of Pedagogical Visual Exercises in Visual Disturbances With Particular Reference to a Case of Atrophic Retinitis.

HELLER. (*Die ophthalm. Klinik*, No. 20, 1906.) Heller presents a case of atrophic retinitis in a girl fourteen years

old. When the patient was first seen she had nystagmus and contracted fields; fingers were counted at one meter. The discs were greyish red and the vessels narrow. Subjected to systematic visual training such as the writer has devised, the patient at the end of a year's instruction read Jaeger type No. 6; she could write in both Russian and German, could sketch, recognize colors, determine form dimensions, describe objects and could freely orient herself in space. Her field of vision remained unimproved.

Heller's first efforts were aimed at teaching his patient the names of the simplest objects put before her. Without aid of tactile sensibility, great difficulty was experienced in acquiring this faculty. Not until such exercises were conducted in the dark and the test objects were illuminated, did improvement set in. The exercises were then carried on in daylight, the objects being placed against a white background. So very gradually the functional ability of the existent visual elements was raised, visual perceptions were transformed into cerebral impressions; stimulation of the cerebral centers again reacting favorably on the receptive ocular apparatus. Color perception was acquired by contrasting different colors with red and blue, colors with which the patient had already familiarized herself. Various other methods were employed to educate the finer visual perceptive faculties.

Systematic visual exercises are to be tried after cataract extraction in those born blind in optic nerve and retinal disease (*retinitis pigmentosa*) and in cerebral amaurosis, provided a certain amount of vision still exists.

A. C. S.

The New Theory of Light and Color Perception.

RAEHLMANN. (*Die ophthalm. Klinik*, No. 19, 1906.) The article contains reproductions of cross sections (magnified 7100-10500 times) of Lippmann photographs. The shaded zones represent wave motion, the light areas the nodal regions. The waves thus portrayed are of different lengths for different colors or color combinations. The author then discusses the physiology of color perception in the human eye, calling attention to the isolation of each retinal cell by the retinal pigment, to the reflection of colors in stationary waves from the outer segments of the rods and cones and to the conformity of

the protoplasm of the inner segments to these waves. According to this theory therefore each visual cell represents a physiological retinal unit capable of receiving separately all light and color sensations, in space perception several or many units being active, each one contributing to the whole picture (*Vide* abstract of Raehlmann's article in *Die ophth. Klinik*, No. 6).

Points in favor of the new theory.

1. *Functional preponderance of the Macula lutea*—clearly defined images are only formed in the macula lutea when cones alone are present. The boundaries of the inner segments are continuous and act as a plane mirror.

2. *The after images and the color decline of strong transient light excitants.*

a. The *positive* after images due to a persistence of protoplasmic contractility.

b. The *negative* after images and the color decline of strong light impressions due to different successive contractions of the protoplasm.

3. *Color blindness*—

Attributed to irregularities (congenital or acquired) in the arrangements of the disks in the outer segments.

4. *Color blindness in the periphery of the retina.*

Here full color perception is impossible because of the oblique position of the peripherally situated rods and cones to the optic axis.

5. *The disturbances of vision and color perception in diseases of the fundus.*

Mere forward displacement of the reflecting surfaces of the rods and cones by pathological abnormalities will only affect visual acuity. Injury to the reflecting surfaces however also impairs color perception.

6. *Dazzling, adaptation, light sense.*

The dazzling resulting from sudden exposure to bright lights after prolonged sojourn in the dark (adaptation) is attributed to the retracted condition of the isolating pigment. Moreover diseases of the pigment epithelium may lead to impaired light sensation, to dazzling and retinal irritation. This is especially the case when the ocular segments are destroyed, preventing reflection of rays through the pupil. A. C. S.

On Optic Nerve Affections and Multiple Sclerosis.

FLEISCHER. (*Die ophthalm. Klinik*, No. 19, 1906.) He discusses the connection between multiple sclerosis and that variety of acute retro-bulbar neuritis occasionally observed in otherwise apparently healthy young individuals. There is marked visual impairment associated with central scotoma. Fundus disturbances are either absent or very trivial. A return to normal vision is the rule.

The author reviewing the material at the Tübingen clinic for the past 30 years collected 24 cases of acute retrobulbar neuritis. Most of the cases followed the usual course. In 25% of the cases, the ocular affection was double sided; in only a few was vision permanently damaged; 21 were between the ages of 17 to 34. Inquiries as to subsequent conditions revealed 16 cases in which multiple sclerosis had supervened. In 10 instances the ocular signs antedated, in four they had occurred synchronously with the nervous symptoms, and in two they had followed the symptoms of multiple sclerosis.

Investigations along these lines were also made in 14 cases of acute optic neuritis, cases in which fundus abnormalities were manifest; also in 8 atypical cases when the neuritic process was a more gradual one. In the first group multiple sclerosis was found in 3 cases, and in 3 others the diagnosis of multiple sclerosis was almost a certainty. The second group was uncomplicated with the disease. Fleischer attributes this form of acute papillitis to lesions in the more distal portions of the optic nerve, citing a case of multiple sclerosis which began with acute retrobulbar neuritis in the eye followed by acute optic neuritis with swelling of the disc in the other eye.

In his opinion post-neuritic conditions are common in this affection, a peculiar opaqueness of the disc being quite characteristic of the disease.

In 39 cases of multiple sclerosis he found blanching of the disc in 13 cases; a veiling or opaqueness in 10 cases. He has so far been unable to determine any connection between multiple sclerosis and chronic optic neuritis (11 cases), post-neuritic atrophy (15 cases), simple atrophy (20 cases), choked disc (11 cases), and several cases of hemianopsia. A. C. S.

On the Influence of Suction Hyperemia on Normal and Abnormal Ocular Conditions.

HOPPE. (*Münch. med. Wochenschrift*, Oct. 2, 1906.) The apparatus used by Hoppe consists of a small glass cup, rubber bulb and mercury manometer. Applied to the closed lids of a normal eye, a 30 mm. mercury pressure produces hyperemia and serous infiltration of the skin and tarsal conjunctiva, the lids assuming a bluish red or violet hue, the congestion being the result of venous obstruction. The reaction is still more pronounced if during the procedure the lids are slightly pulled away from the eyeball. Lacrimation then becomes more intense, the secretion being of a sero-muco-sanguinous nature. The contents of the Meibomian tubules and goblet cells may also be expelled. The bulbar and episcleral veins macroscopically show no changes.

The signs of congestion rapidly subside after removing the instrument. Conjunctival and cutaneous hemorrhages may occur but are more in evidence after exposing the lids to higher pressures. In such instances the lids may remain discolored several days. Thirty to forty mm. pressures cause no pain. No disturbances of the visual function were noted.

The Effects of Suction on Certain Diseases of the Lids and Conjunctiva.

Thirty cases were studied; six chronic, three acute cases of purulent inflammation of the Meibomian glands, one chronic blepharo-conjunctival ulcer, one chronic hyperemia and thickening of the lid margin, two furuncles of the eyebrow, and one cold glandular abscess. The other cases included hordeola of various sizes and in various developmental stages.

On the whole this method of treatment proved to be very satisfactory. The relief from pain was prompt, enabling the patient to attend to his occupation between treatments. Incipient inflammatory processes were checked, advanced conditions speedily regressed, often with the expulsion of a purulent core. Chalazia were less easily influenced by this treatment. Where pus had already formed, he did not hesitate to make small incisions before applying the instrument.

Thirty to forty millimeter pressures applied 15 to 30 minutes at a time, two or three times daily, usually suffice. This method, he contends, should not be considered the only method

of treatment but rather an additional remedy at our command; often used to best advantage in conjunction with other therapeutic measures. The apparatus should always be applied by the physician himself. A. C. S.

On the Relations of the Orbit to the Pterygo-palatine Fossa.

KRAUSS. (*Münch. med. Woch.*, Jan. 1, 1907.) Krauss contends that the relations of the orbit to the pterygo-palatine fossa have never received a careful consideration. Though it is well known that the inferior orbital fissure which connects the two fossæ serves as a passageway for vessels and nerves, it is not generally known that at times the inferior ophthalmic vein or one of its branches passes through the foramen.

A study of comparative anatomy shows that the free communication between the orbit and temporal fossa (pterygo-palatine fossa) in the lower animals, is replaced in the higher mammalian types by the inferior orbital fissure. Even in man, however, variations exist, variations which are not accidental but dependent upon the size and number of vessels traversing this canal. That the size of the superior orbital fissure may be proportional to that of the inferior orbital fissure and vice versa, is also a tenable supposition.

It is also probable that instead of flowing into the cavernous sinus, most of the venous blood from the globe may occasionally pass through the inferior orbital fissure, in fact the central vein of the retina may be contained in this canal, which throws light on certain clinical manifestations that have baffled interpretation. This fossa and fissure, furthermore, may contribute the connecting link between disturbances of the nasopharynx and those of the orbit.

Krauss also advances the theory that vascular swellings situated in the pterygo-palatine fossa and secondarily invading the orbit may cause pulsation of the eyeball, a case of congenital pulsating enophthalmos having convinced him that our present conceptions as to the origin of such conditions are truly open to just criticism. To obtain a better knowledge of the normal and abnormal relations of the orbit to this fossa further investigations are necessary; a revision concerning anatomical relations must be made, including special study of the inferior orbital fissure and the course of the orbital venous blood supply. A. C. S.

On the Experimental Transference of Syphilis to Rabbits' Eyes.

SCHUCHT. (*Münch. med. Woch.*, Jan. 15, 1907.) Schucht inoculated fifty-one rabbits' eyes with syphilitic virus, the following methods of inoculation being resorted to:

1. Cornea needled and virus rubbed in.
2. Insertion of a portion of a diseased gland into a pocket made in the cornea.
3. Opening of the anterior chamber with lance knife, iridectomy, introduction of gland tissue between iris and cornea.
4. Anterior chamber opened without injuring the iris, introduction of a bit of gland substance.
5. Injection of a solution of syphilitic virus into the anterior chamber by means of a Parvaz syringe without wounding the iris.
6. Injection of this virus into the vitreous through the sclera.

13 eyes developed parenchymatous keratitis.

3 eyes developed iritis.

1 eye developed iritis.

1 eye developed parenchymatous keratitis, consecutive to iritis.

In one eye when the injection was made into the vitreous, there appeared in the wake of iritis a gummatous form of iritis in conjunction with a parenchymatous keratitis. Two eyes succumbed to panophthalmitis. Three animals died on the 12th, 14th and 16th days. The ocular findings in these eyes were negative.

Parenchymatous Keratitis—Methods.....1.....6 cases
2.....1 case

After a period of inoculation varying 3.....2 cases
from 19 to 43 days, injection at the 4.....3 cases
upper corneal limbus was observed. 5.....1 case

Deep vessels formed in the upper corneal parenchyma which became opaque. At the end of several weeks inflammatory regression commenced with or without leaving behind corneal opacities.

Iritis, Methods3.....1 case
4.....1 case
5.....1 case
6.....2 cases

The average period of inoculation was 16 days.

Two varieties:

- a. Diffuse (multiple posterior synechiae).
- b. Circumscribed (resembling condylomatous iritis).

Inflammation generally subsided in 7 to 14 days.

The type resembling gummatous iritis, (method 6), 1 case.

There was swelling of the upper ciliary margin of the iris with filling in of the anterior chambers associated with a deep vascularization of the cornea apparently continuous with the iris protuberance.

Positive results thus followed every method of inoculation, injections into the vitreous being especially effective. Spir-ochaete were found in the corneas in five cases of parenchymatous keratitis (Seviditi and Giemsa's methods). The negative results in 7 cases he attributes to the fact that only cross sections were examined. No lesions in the internal organs, and no cutaneous disturbances have so far occurred. A sero-diagnostic blood examination also disproved any generalized infection.

Inoculations of monkeys with corneal or iris tissue have also so far proven negative, which Schucht believes may be accounted for by the decreased virulency which frequently follows successive inoculations. A. C. S.

On a Direct Transmission from the Visual to the Kinaesthetic Cortical Centers of Word and Letter Images.

MAYENDORF. (*Wiener klinische Wochenschrift*, Nov. 8, 1906.) The writer reports a case of aphasia, the important features of which were loss of spontaneous speech, inability to repeat words or name objects, uncomplicated with word or letter blindness, a condition suggesting either an anatomical or physiological connection between the visual center for word images and the motor speech center without participation of the auditory speech center.

He thinks it possible that word or letter blindness may result from a lesion in a single fiber bundle, probably the dorsal portion of the optic radiations. Sections of a brain of an individual who had cortical blindness with contracted central vision, within which however he was neither mind or word blind, showed parts of this bundle still intact. He

infers from this that this dorsal portion is a continuation of the macular fibers; a lesion affecting the former will result in no visual impairment (the macular fibers being connected with both hemispheres), but will cause visual aphasia.

Moreover during the genesis of speech, the formation of association tracts between the centers for visual and those for auditory conceptions precedes the development of kinæsthetic memory regions. During the genesis of reading on the other hand, kinæsthetic centers already exist enabling association tracts to unite these with the visual memory centers.

Granting their physiological suppositions to be true it would be incorrect to contribute alexia to a lesion in the association fibers connecting the visual with the auditory regions. That a lesion in the auditory speech center itself does not necessarily result in word or letter blindness is shown by a study of the symptoms of the case under consideration. According to the writer, every aphasia due to a lesion extending beyond the cortex must be considered a cortical, subcortical and transcortical aphasia. He localizes the lesion in the posterior portion of the left inferior temporal lobe, embracing the posterior end of the first temporal convolution, the supramarginal and angular gyri escaping.

The initial word and mind blindness and the right sided hemiplegia are attributed to temporary disturbances of nutrition in the lower portions of the internal capsule, where the fibers from the central convolutions and those of the dorsal portion of the optic radiations are in close proximity.

The deductions which he draws are as follows:

1. The existence of a direct physiological if not anatomical connection between the cortical centers for visual and the kinæsthetic centers for word and letter images.
2. The unimportance of auditory conceptions for the visual conceptions of words and letters.

A. C. S.

Cocain and Its Substitutes: Tropacocain, Holocain, Eucain, Stovain, Alypin and Novocain in Ophthalmology.

WINTERSTEINER. (*Wiener klinische Wochenschrift*, Nov. 8, 1906.) Wintersteiner still believes cocain to be the best local anesthetic. The objectionable features of cocain are supposed to be:

1. *Its Toxicity.*—From an ophthalmological viewpoint this is hardly worthy of consideration. The toxic manifestations occasionally following instillations of the drug are seldom of a serious nature and yield readily to treatment. The tendency at the present day is to employ much weaker solutions for subcutaneous and subconjunctival injections than was formerly the custom. The additional use of adrenalin increases the ischemia thus localizing the drug to the site of injection making smaller quantities of cocain necessary, at the same time prolonging the anesthesia.

2. *Its diminished efficacy in inflamed structures.*—In such instances anesthesia is rendered more certain by preliminary instillations of adrenalin (suprarenin, tonogen, epirenan, etc.,) or if necessary by subcutaneous or subconjunctival injections of 1% cocain combined with adrenalin.

3. *The production of mydriasis and accommodation paresis.*—These are distinctly minor objections. Cocain is generally indicated when visual disturbances already exist or in cases which anyhow would necessitate atropin and bandage.

4. *Its deleterious effect on the corneal epithelium.*—Any drug which anesthetizes the cornea subjects it to trophic disturbances. Operations, therefore, should not be unnecessarily prolonged. The dense corneal opacities at times noted after cataract extractions and attributed by some to cocain are, as Mellinger has shown, the effects of antiseptic solutions used concurrently (bichlorid of mercury irrigations of the anterior chamber).

5. *Its injurious influence on intra-ocular tension and wound healing.*—Dalen has proved that the healing of central tissue is the same whether cocain has been used or not. Abnormal wound healing must be attributed to the age of the patient or to faulty operative technique. In the normal eye increased intra-ocular tension following cocain instillations is succeeded by a gradual lowering of tension. In a glaucomatous eye or one predisposed to glaucoma an acute glaucomatous attack is sometimes precipitated. The drug should consequently be used with care especially in the aged.

6. *The difficulty encountered in sterilizing solutions.*—One sterilization by heat will only slightly detract from its

anesthetic powers. Moreover the drug is now so cheap that freshly sterilized solutions only should be employed.

He then discusses in full tropacocain, holocain, eucain and stovain. Each of these apparently has some advantages not possessed by cocain, (little or no influence on the size of the pupil, on accommodation or on intraocular tension; sterilization without therapeutic impairment; lessened toxicity). According to the author, the ideal substitute must contain the superior virtues of cocain, but be without its shortcomings. Not one of these preparations has shown qualities that would make it an ideal substitute; in fact, they all possess undesirable characteristics which overshadow their good qualities. These are chiefly:

1. Their local irritant action.
2. The hyperemia which they produce. Even the addition of adrenalin is not so advantageous, because the secondary dilatation rather favors the hemorrhage tendency.

Alypin. Though alypin seems to have many excellent features, our knowledge concerning its effects is still more or less uncertain. He has been unfavorably impressed by the free hemorrhage in spite of simultaneous adrenalin instillations following operative wounds made under alypin anesthesia. The hyperemia which ensues is probably not the result of a vasoconstrictor paralysis. He concedes that the hyperemic state is quite a desirable preliminary effect to instillations of dionin or dionin powder.

Its lessened toxicity recommends it for subcutaneous injections.

Novocain. It is without any local irritant action. The anesthesia it produces is not only more fugacious, but less complete than cocain anesthesia, the conjunctiva being especially resistant. While it is five or six times less poisonous than cocain, such high concentrations must be employed that its toxicity almost rises to that of cocain. A. C. S.

Subconjunctival Injections of Sterilized Air in the Treatment of Sclerotizing Keratitis of Tuberculous Origin and Infected Marginal Corneal Ulcers.

TERSON (*Die ophthalm. Klinik.*, No. 23, 1906). Terson alludes to Chesneaux's article on sclerotizing keratitis of tuberculous origin, believing this disease to be identical with what he

has termed "nodular sclero-episceritis," a condition which he also associates with the tuberculous infection. He also agrees with Chesneaux that the best treatment for such cases, particularly when the tuberculous element is indisputable, to be subconjunctival injections of sterilized air. The air is aspirated through compressed layers of sterilized cotton into a clean syringe. The injections are made in the usual manner. The whole bulbar conjunctiva, provided there are no adhesions, may thus be distended. The procedure is painless and entirely free from danger.

He reports one case of sclerotizing keratitis of probable tuberculous ethology in which this treatment yielded excellent results. In all, eight injections, in three-day intervals, were given. Marked improvement followed the first injection.

He also cites two cases of marginal ulcerative keratitis, the first complicated with iritis, the second a relapsing form of superficial infectious marginal ulcerative keratitis. In both instances injections were resorted to with immediate benefit to the ocular condition. Terson declares this method efficacious not alone in corneal disease dependent upon constitutional derangement, but also in disease of the corneal surface induced by secondary or exogenetic influences, ozena, dental caries, stomatitis, blepharo-conjunctivitis, trichiasis, etc. Whether such injections are as effective as injections of 1/2000 corrosive sublimate, in preventing recurrences, he is as yet unable to say. Neither is he entirely satisfied as to why such therapy should be productive of so good results.

A. C. S.

Concerning Correlation in Heredity From an Ocular Standpoint.

BEST. (*Munchener med. Wochenschrift*, Jan. 8, 1907.) He points out that the inherited refraction really depends upon the relationship of the form-determining factors of the eye, and that the correlation of such factors is inherited. The important influence of heredity on astigmatism has been well studied by Steiger. The author then refers to the frequent association of astigmatism with irregularly shaped discs, congenital punctate opacities, pupillary membrane, congenital amblyopia and squint.

The embryological association of the retina with the dioptric ocular mechanism is so close that the occurrence of defects in the nervous portion usually means a correlative mal-

formation of the cornea, lens or other ocular structures. It is also conceivable that after impregnation the included pathological abnormality may not be potent enough to completely assert itself, only a slight derangement of the normal embryological development occurring, thus accounting for the transformation of heredity taints. Example: Coloboma of chorioid in parent, iris coloboma in offspring.

The Hereditary Correlation of the Eye to Other Structures.—Having briefly referred to the frequency of ametropia, eye muscle anomalies, color blindness, etc., among less talented school children, and to the still more marked frequency of such conditions in the feeble-minded and in epileptics, he calls attention to the frequency of ocular malformations in association with hereditary mental disturbances. He compares an endogenous psychosis (paranoia) with an ectogenetic psychosis (parietic dementia), and finds that in the former high myopia, albinism, conus below and medullated nerve fibers are much more common than in the ectogenetic psychosis. Amaurotic family idiocy and Mongolian idiocy are also cited as examples. Gross ocular malformation (microphthalmus, cyclopia, etc.) are often found in connection with polydactylism, hypospadia, harelip, etc.

Ocular disturbances related to auto-intoxication may be inherited (chorioiditis, iridocyclitis, cataract). Best believes a certain amount of hereditary correlation exists between all organs.

A. C. S.

On the Etiology of Contralateral Visual Disturbances and Blindness the Result of Nasal Affections.

ONODI (*Die ophth. Klinik.*, No. 20, 1906). Onodi describes in detail the topographical relations of the posterior ethmoidal cells and the sphenoidal sinus to the optic nerve and chiasm, calling attention to the thin bony partition which separates them from the posterior ethmoidal cells and sphenoidal sinus of the opposite side. He cites cases reported by Wohlmuth, Freudenthal, Oppenheimer, May and others, in which contralateral optic nerve affection followed fractures of the orbital roof, Killian's operation, unilateral empyema of a sinus, etc. While the author in a measure agrees with the views regarding the etiology of such conditions as expressed by these writers, he is more inclined to ascribe them to the

close anatomical relations of the optic nerve and chiasm to the posterior nasal region of the opposite side.

He disagrees with Mendel and Lapersonne, who believe the occurrence of uniocular neuritis especially indicative of a nasal complication, referring to cases and to the anatomical relations which permit disease of the posterior ethmoidal cells or sphenoidal sinus of one side not only to involve the opposite optic nerve and the chiasm, but both nerve trunks. These contralateral disturbances are etiologically associated with infectious processes, physiological and congenital bony defects, circulatory disturbances, inflammatory progression and contralateral indirect fractures of the optic canal.

On account of the delicate structure of the ethmoidal cells, pathological changes of the ethmoid are particularly liable to result in visual disturbances; furthermore, the ethmoidal veins frequently lie exposed in the semicanalis ethmoidalis. He concedes that in many cases the relationship between ocular and nasal diseases cannot be determined; sometimes both may occur simultaneously as independent affections. A. C. S.

A Case of Metastatic Cphthalmia With the Anatomic Investigation.

HIRSCHBERG, J., and GINSBERG, S. (*Centralbl. f. prakt. Augenheilk.*, February, 1907), report a case of metastatic abscess of the vitreous following articular rheumatism. The eye was enucleated on account of pain and also on account of the danger of sympathetic ophthalmia. The anatomic findings follow:

Behind the iris lay a yellowish white layer, 2 mm. thick, covering the pars plana corp. cil. to the ora. Some gray milia on the inner surface of the posterior segment of the retina.

Iris irregularly infiltrated with mono- and polynuclear round cells and mast cells. On the anterior surface are scattered clumps of exudate cells and homogeneous, coagulated masses.

The posterior half of the corpus ciliare is detached from the sclera by a homogeneous coagulum containing red and white cells. The ciliary muscle is edematous. Pale, vesicular structures fill the intermuscular tissue and separate the muscle bands from each other. The unstained epithelium of the pars plana is detached from the pigment epithelium by a small layer of tissue composed of cells with large, round or irregularly oval, slightly stained nuclei, a few leucocytes and

lymphocytes, cells containing pigment and delicate blood-vessels. The ciliary epithelium is thickly studded with pus cells, and is covered by a thick layer of young granulation tissue, rich in cells and blood vessels. This latter passes over into the exudate lying in the anterior part of the vitreous, which consists partially of fibrin enclosing red and white cells and partially of masses of pus cells with a few clots.

The vitreous, so far as it is still present in the specimen, shows scattered pus cells and increased cellular contents.

The chorioid anteriorly is infiltrated with small cells and is detached from the sclera by a bloody exudate.

The retina for a short distance at the ora serrata is detached from the chorioid by a bloody exudate. Going backward from the ora, there is a purulent infiltration of the innermost layer, in varying degrees. In places, there are only rests of ganglion cells and tissue fibers. A dense infiltration of small cells surrounds nearly every vessel. In many places, especially posteriorly, there are miliary clumps of pus cells, recognized macroscopically as gray nodules. At the disc the fibers are separated from one another by a homogeneous mass, deeply stained by eosin, which contains unstained drops and nuclei.

The disc shows intense swelling and perivascular infiltration with pus cells, lymphocytes and plasma cells. A typical bit of granulation tissue projects from the funnel shaped depression into the vitreous and contains rests of the hyaloidea. In the nerve itself are some polynuclear leucocytes. No micro-organisms were found.

Summary.—The granulation tissues on the disc and the pars plana shows the same stage. Therefore, probably, at these two places there occurred an invasion of the micro-organisms in the blood, causing an exudative inflammation. The iritis and retinitis were probably caused by the toxins and not by germs.

C. L.

The Iris Angle in Glaucoma.

DE VRIES (Amsterdam), (*Ref. in Klin. Monatsbl. f. Augenheilk.* April, May, 1906), investigated the relations in the angle of the anterior chamber in twenty-four eyes enucleated for glaucoma. Without exception the Knies-Weber closure of the angle was present, but the entire circumference was not involved in all the cases, nor the ligamentum pectinatum in all.

Several cases showed the genesis of the adhesion. In one case of chorioidal sarcoma there was a cellular exudate in the ligamentum pectinatum, in the wall of Schlemm's canal, and in the ciliary processes, consequently an inflammation of the angle. In two cases of glioma retinae there were necrotic tumor cells in the angle, to which V. ascribes an inflammatory action. In two cases of dislocation of the lens into the vitreous, there was free communication between ant. and post. chambers but an incomplete closure of the angle. This cannot be explained mechanically in these cases.

E. A. S..

Concerning the Treatment of Glaucoma.

PROF. E. V. GROSZ (Budapest), (*Ref. in Klin. Monatsbl. f. Augenheilk.*, July, August, 1906), places the chief reliance upon iridectomy in all forms of glaucoma. His results after operation in 237 cases which were under observation for a long time were as follows:

In the prodromal stage, success in 29 cases..... = 96%

In the active stage, success in 146 cases..... = 87%

In glaucoma simplex, success in 62 cases..... = 70%

He operates usually without narcosis after instillation of 2% pilocarpin, 5% cocaine and 1 to 2 drops of 1-1000 solution of tonogen (a Hungarian suprarenal preparation); in painful eyes he injects 1c. g. of morphia beforehand. The wound is made very peripheral and a broad iridectomy is done.

Indications—In the prodromal stage he prescribes pilocarpin. If, however, the other eye has been lost by glaucoma, if the social conditions of the patient prevent proper control of him, or if in spite of the miotic, the prodromal symptoms recur, he advises iridectomy. In acute attacks, with high tension, he uses hourly instillations of pilocarpin, and if the symptoms do not lessen in three days, operation should not be postponed. In chronic and absolute inflammatory glaucoma, iridectomy is indicated, if it is technically possible to perform; likewise in glaucoma simplex he operates in all cases, as his experience has shown that the chances for checking the process are increased, rather than diminished by operation. In juvenile glaucoma he performs sclerotomy, and moreover does this operation whenever glaucoma is not checked by a good iridectomy. The comparatively small number of cases in which he performed cyclodialysis does not permit him to come to a final

decision as to its value. According to Imre's statistics 22% of all the blind in the Hungarian lowlands have lost their sight by glaucoma and in the University Eye Clinic 42% of the glaucoma cases had lost one eye at the time of admission.

E. A. S.

Concerning Iritis Glaucomatosa.

PROF. J. V. CSAPODI (Budapest), (*Ref. in Klin. Monatsbl. f. Augenheilk.*, July, Aug. 1906). This condition described by Goldzieher occurs in cases in which a rheumatic iritis with excessive fibrinous exudate recurs with glaucomatous symptoms; the use of pilocarpin is followed by cure. In the cases observed by Csapodi; the iritic symptoms so predominated that pilocarpin treatment caused aggravation of the process, while scopolamin, in spite of the increased tension cured the process. Csapodi warns against the use of cocain in glaucoma iridectomies and recommends instead alypin. In certain cases, however, mydriatics with atropin are said to produce decreased of tension by paralyzing the accommodation. E. A. S.

Critical Remarks Upon the Histological Diagnosis of Sympathetic Ophthalmitis, According to Fuchs.

RUGE (*Arch. f. Ophthalm.* LXV., part 1), attacks the correctness of Prof. Fuchs' theory of the anatomical conditions which are characteristic in the exciting eye in sympathetic ophthalmia. He says, in the first place, that as giant cells were found in only one-half the number of Fuchs' cases and the epithelioid cells were absent in one, and also in a number of his own, neither can be considered as necessary to the production of sympathetic trouble, and their absence is not sufficient to justify the throwing out of a clinical diagnosis of sympathetic disease. He admits that Fuchs is right in believing that we can make the diagnosis with the greatest probability, if we find high grade round cell infiltrated with numerous epithelioid cells and giant cells in the uveal tract, but he does not think these are absolutely characteristic of sympathetic inflammation alone. He does not believe that the condition is essentially a proliferative one, but is only a form of plastic inflammation, the severe forms at one end, producing sympathetic trouble, and the milder ones not.

Between the two extremes are many border line cases. The typical changes have been found by Fuchs and others, includ-

ing Ruge, in eyes which have caused only sympathetic irritation, and in one case of serous uveitis a proliferative uveitis, although without epithelioid cells, was found.

He disputes Fuchs' findings that the chorioid is the portion of the uveal tract most involved, and especially that its posterior portion is chiefly involved.

He does not admit, however, that pure cases of sympathetic inflammation, can not in some instances produce a superficial plastic exudation, that is, that to explain this we must assume a mixed infection. He cites a case of his own in the exciting eye of which mixed infection could not have occurred, and three cases in which a plastic superficial exudation occurred in the sympathizing eye. As Fuchs takes the stand with others that anatomical changes in the sympathizing eye must be a paradigm of the typical changes in the exciting eye and no mixed infection can be assumed in the sympathetic eye, he is not justified in claiming that the superficial exudation is not a product of pure sympathetic inflammation. So while not denying that there is a mixed infection in many cases he holds to Schirmer's view that there is *pure sympathetic plastic exudation*.

In considering the cases of sympathetic inflammation reported in connection with chorioidal sarcoma, he believes with Schirmer that they should be excluded. In all cases described there has been necrosis of the sarcoma, and he thinks the disease of the second eye may be caused by changes produced thereby in the general body fluids, the symptoms as it were of a constitutional disease.

The diagnosis of sympathetic inflammation must therefore, as Schirmer says, be a clinical one, which may be confirmed later by microscopical examination. E. A. S.

Further Experience With Cyclodialysis Based Upon Fifty-Six Operations.

HEINE. (*Münch. med. Wochenschr.*, 1906, No. 2, Ref. in *Die ophthalm. Klinik*, Nov. 5, 1906, p. 653.) Heine believes cyclodialysis to be the best operation for glaucoma; in cases with bilateral glaucoma upon which an iridectomy had been performed on one eye and cyclodialysis on the other, the results were better in the eye with the cyclodialysis operation. The operation is indicated also in secondary glaucoma under certain conditions. It is easy to avoid perforations into the

vitreous, and it is preferable to iridectomy, as it is less dangerous. The pupil moreover remains round and therefore reacts better to miotics; and there is no cosmetic defect. It is no more dangerous in juvenile glaucoma, glaucoma due to luxatio lentis, hemorrhagic glaucoma, etc. (in contradistinction to iridectomy) than in other forms. It is moreover possible to perform when the iris periphery is in contact with the cornea, and it can be more often repeated than iridectomy. Heine bases his conclusions on 56 operations. E. A. S.

Concerning Experimental Glaucoma.

ERDMANN (Ref. in *Die ophthalm. Klinik*, Aug. 28, 1906) reported at the Heidelberg Congress the production of glaucoma in rabbits by electrolysis. The positive electrode, in the form of a steel needle, was introduced into the aqueous, the negative pole was applied to the back. He ascribed the production of glaucoma to the deposit of the fine granular oxidation products of the steel in the spaces of Fontana and to the cell proliferation which they caused. Frequently such experiments led to too great increase of tension and the production of phthisis bulbi. Electrolysis of aqueous humor removed from a rabbit's eye and placed in a sterile dish, gave an olive green precipitate of the iron particles, and the injection of this material into the anterior chamber of another rabbit caused a gradually increasing inflammatory reaction, and in about 75 per cent of the cases increase of tension, with gradual enlargement of the eye, and excavation of the papilla. After one to two weeks the inflammatory appearances cleared up and a state of chronic glaucoma remained, which resembled buphthalmus in man—clear, more or less insensitive cornea, deep anterior chamber, atrophic iris, sluggish pupil and high tension lasting months. E. A. S.

Concerning Blindness Caused by Atoxyl, Methyl, Alcohol, Carbon Bisulphide, and Felix Mas.

KRUEDENER (*Zeitsch. f. Augenheilk.*, 1906, *Ergänzungsheft*) reports a case of blindness due to the use of atoxyl (meta-arsen-anilid). The patient took about 50 g. of the drug in the course of seven months. Both nerves became atrophic, one eye became blind and vision was reduced in the other to 1/15, despite treatment. The visual fields were greatly con-

tracted from the beginning, especially for colors, and a paracentral scotoma for gray appeared. The patient was entirely healthy otherwise. Owing to the acute course of the process, after its appearance, K. assumes a direct injury to the nervous elements, either to the nerve fiber or more probably to the ganglion cells. A similar case is recorded by Bornemann (*Münch. med. Wochenschrift*, No. 22, 1905), after 27 g. of atoxyl; he is uncertain whether the effect is due to the arsenic or to the anilid. K. also reports several cases of methyl alcohol blindness, which have become more common in the Baltic provinces of Russia. He recognizes two types—one a retrobulbar neuritis which is amendable to treatment, and secondly a primary degeneration and atrophy. He reports, further, optic nerve atrophy from inhalation of carbon bisulphide in a chemical manufactory, and intoxication by felix mas with temporary blindness and symptoms of retrobulbar neuritis. Further, fatal poisoning of a dog by felix mas. E. A. S.

New Investigation on the Filtration of Fluids From the Eye.

TH. LEBER and A. PILZECKER (*Archiv f. Ophthalm.* LXIV, 1). This is an experimental paper largely in refutation of Troncoso's claims in relation to filtration of fluids from the eye.

Leber asserts the accuracy of his manometer, if it is properly used. He further shows that the variation in pressure between the vitreous and anterior chamber, when injections are made into the latter, is very slight ($\frac{1}{4}$ to $\frac{1}{2}$ mm. Hg.), and therefore not of importance. Consequently the eye can be considered as a hollow ball of one chamber filled with fluid (contrary to Troncoso's belief), because the diaphragm separating the chambers is very easily movable and also easily penetrable by fluid.

The authors confirmed also Leber's earlier experiments proving that the exchange of fluids to and from the eye is exceedingly slow. The filtration and therefore the secretion of the aqueous appears to be even slightly less rapid than they had hitherto assumed.

They demonstrated likewise that the eye is able within a comparatively short time to accommodate itself in some degree to changes of volume without the occurrence of changes in intraocular tension. The absolute amounts of these changes

in volume are indeed small, but the property is of great importance to the eye because it opposes the appearance of variations in tension. This is of especial importance on account of the great elasticity of the ocular tunics, in consequence of which, as experiments of v. Schulten and W. Koster have shown, the increases in volume following immediately upon increasing tension are exceedingly small, and a minimal increase of the contents of the eyeball produces a very noticeable increase of tension. If the pressure, however, varies gradually, the increase in volume with the same increases of tension can be double in amount.

In addition to changes due to stretching, a change in form also occurs, the eye approaching more and more a spherical form, which with the same surface extent is the form of body with the greatest contents. This change often has been shown by W. Koster to occur in the human eye up to a certain point. The walls of the eye, moreover, being organized membranes, are subject to some after-effect of tension and do not at once regain their original form. In pathological conditions and in old age, and in other conditions producing increased rigidity of the sclera, the after-stretching of the tunic will be less and thereby a greater disposition to glaucomatous tension will be given. That in the conditions mentioned such a disposition exists is in fact generally accepted; but its appearance was difficult to explain under the previously given ideas of the elasticity of the eyeball. According to Leber, however, the extensibility of the eye tunics has been estimated far too low (by one-half), so that a pathological sclerotization may be a considerable factor in diminishing it.

E. A. S.

Contribution to Our Knowledge of the Permanent Results of the Operative Treatment of Glaucoma.

PROF. W. KOSTER, Gzn. (Leiden) (*Archiv. f. Ophthalm.*, Vol. LXIV, 2) gives a series of tables showing the ultimate results of the operative treatment of various forms of primary and secondary glaucoma, and comes to the following conclusions:

1. Iridectomy, in acute inflammatory glaucoma, produces satisfactory permanent results both in respect to vision and tension. There is no reason, even in consideration of the ef-

fect of sclerotomy in other forms of glaucoma, to depart from the prevailing opinion that iridectomy is the operation indicated in the acute form.

2. Iridectomy has also a very favorable result in chronic inflammatory glaucoma in respect to the tension, and is the operation of choice, although vision may suffer in more than one-half the cases.

3. In glaucoma simplex, sclerotomy gives results more favorable to vision than iridectomy. As, however, both operations give about the same results on tension (a very satisfactory result), we must give iridectomy the preference, as it produces the effect after one operation; whereas sclerotomy must be repeated in some cases. Whenever iridectomy is contraindicated on account of the danger of hemorrhage or for other reasons, a sclerotomy may be tried with good hope of success; in fact, it may be chosen as the simpler and rather more promising procedure, whenever the patient can be kept under constant observation. Especial emphasis must be laid upon the fact, learned by experience, that the operation yields its best results when done in an early stage, before permanent injury has been done to the eye or its function.

4. In *buphthalmus* operative treatment should be begun as soon as possible and the best method, as Snellen advised, consists in the performance of small sclerotomies.

5. In secondary glaucoma due to *seclusio pupillae*, *staphyloma corneæ*, and *keratectasia*, and also in *leucoma adherens*, iridectomy should be done as early as possible.

Prof. Koster never advises a miotic treatment, except in *buphthalmus*, and believes by its use the correct time for the operation may be passed and his experience with miotics in cases refusing operation has not been satisfactory. In the majority of cases the eyes are indeed painless but the disease progresses steadily, and he considers the treatment dangerous. As preparatory to operation and subsequent to it he thinks it should be recommended.

E. A. S.

Haemophthalmus in Glaucoma.

GRAEFENBERG (*Archiv f. Augenheilkunde*, LVI, 1, Sept., 1906) describes a case of secondary glaucoma due to *staphyloma* of the cornea in which anatomical examination revealed

a large retrochorioidal hemorrhage, the origin of which was one of the posterior ciliary arteries which opened directly in to it. The glaucoma was secondary to the staphyloma and caused vascular changes to which the hemorrhage was due. In this case as in the majority of similar ones the hemorrhage was not the cause but the result of the glaucoma.

E. A. S.

A New Method for the Operative Treatment of Glaucoma (Fistula Subconjunctivalis Camerae Anterioris).

HOLT (Christiania), *before the Heidelberg Congress (Ref. in Klin. Monatsbl. f. Augenheilk., Sept., 1906)*. Since 1904 Holth has operated in glaucoma by systematically producing a subconjunctival prolapse of the iris, as he had found the best results followed a cystoid scar, in which a small portion of the iris periphery had been included in the wound. He tries to avoid infection by making the conjunctival incision 10 mm. from the corneal limbus. Usually a fistula is produced by an iris fold which is lined with pigment epithelium and which extends to the subconjunctival connective tissue. But adhesion to the iris, without formation of a fistula, can lead to normal tension tho' less certainly, by communication of the uveal and subconjunctival blood and lymph vessels. He has performed the operation (*iridencleisis antiglaucomatosa*) 41 times. In 11 cases iridectomy had been performed previously. In 21 cases it was combined with iridectomy and in 9 with iridotomy. In 35 cases normal tension was permanently secured, in 31 at once, in 4 after several months. Holth has seen moderate irritation of the iris after the first week, but with no bad effect upon tension or vision. Iridectomy is not necessary and can be replaced by a meridional iridotomy, if a coloboma is desired.

E. A. S.

Cavernous (Lacunar) Atrophy of the Optic Nerve and Dehiscence of the Sclera in High Myopia.

POLATTI (*Klin. Monatsbl. f. Augenheilk.* Jan. 1906) describes the occurrence of cavernous atrophy of the optic nerve, such as Schnabel has described as the cause of glaucomatous excavations and has declared to be specific for glaucoma. Polatti's case which was examined and studied in Axenfeld's clinic would prove that Schnabel's contention would not hold

for all cases. It is, moreover, difficult to understand why the caverns should collapse in an axial direction and yet cause a yielding of the lamina cribrosa. A collapse in a transverse direction would be more conceivable from a mechanico-physical viewpoint, and this would correspond also if this form of atrophy occurred really only in glaucoma. There can, moreover, be no doubt of the production of the excavation by increased pressure, in view of the observations of the disappearance of an excavation after puncture and its recurrence after renewed hypertension. (Axenfeld, K. M. f. A. 1903.)

E. A. S.

Operation for Absolute Glaucoma With Remarks Upon Glaucoma Lenses.

TOPOLANSKI (*Archiv f. Augenheilk.*, April, 1906) advises the removal of the lens in absolute glaucoma as a means of quieting the pain in these blind eyes, and has found the results good and much preferable to enucleation. He gives the patient an injection of morphine fifteen minutes before the operation, and after cocainization of the conjunctiva injects a 4 to 5% atropilin-cocain solution beneath the conjunctiva. The incision is preferably made with a very broad lance knife and the section widened by scissors. Cystotomy is made with a sharp hook, and the delivery of the lens is assisted by means of a sharp double hook as soon as it presents. Cortex which remains is removed, if possible, by a suction apparatus, but remaining cortex usually causes no trouble, probably on account of the atrophic condition of the iris, and may be absorbed very slowly or remain permanently, because of the slow change of intraocular fluids. He does not consider loss of vitreous a disadvantage, and has not seen intraocular hemorrhage occur. This complication is always to be looked out for, but is not to be considered a contraindication to operation. Topolanski discusses the appearance of opacities in the lens after operation in glaucoma, and says the most usual site of the opacity is in the periphery of the lens, generally in the coloboma, but at times at a point directly opposite. He has seen them occur in operations after faultless technic, and in positions which could not have been injured by instruments. He believes, therefore, that they are due to spontaneous ruptures of the capsule, at the position of the attachment of the

zonula fibers, by the sudden forward movement of the lens system, when the anterior chamber is evacuated. A grayish zone is formed, which sends radii toward the nucleus of the lens, and on the capsule a deposit is formed, like a healed capsule wound, the lens remaining otherwise clear. He describes further a diffuse opacity of the lens, with a grayish blue reflex, which is present at the first examination after operation and lasts two to five days, preventing any view of the eye-ground. It then slowly clears from the periphery, until the lens recovers its former transparency. He thinks this is not due to pathological changes in the lens, but to a shifting of the lens fibers caused by the sudden lowering of tension and the forward movement of the lens during operation. He has seen it reappear after accidental opening of the chamber, but the opening of the chamber cannot be the only factor, as it does not occur in simple punctures. E. A. S.

Investigation Upon Tobacco Alcohol Amblyopia.

BAER (*Archiv f. Augenheilkunde*, Vol. LIV, 4, April, 1906) gives the results of the examination of over 100 cases of amblyopia due to tobacco and alcohol, which he has personally examined. He found the condition especially common in Northern Tyrol, where the poorer classes are badly nourished, where the climate is rough and the peasants drink large quantities of bad whisky, and especially among railroad employes, engineers, conductors and watchmen, who use the alcohol to create warmth. Fusel of the worst sort is much used, and rum in large quantities is added to the tea by the peasants. In Prof. Bernheimer's clinic at Innsbruck 1% of all cases were tobacco amblyopias (Uhthoff gives 0.5% in Graefe-Saemisch). Bär was struck in his investigations of the psychiatric clinic and insane asylums, with the few cases of optic nerve involvement in patients suffering from delirium and alcoholic neuritis. He reports only about 5% of cases complicated with neuritis of other nerves, among his cases of amblyopia, although a higher percentage is given by Rennert, Thomson, Strümpell and others.

The most frequent age was between 40 and 50 years. Youngest patient 17 years; oldest 70 years. Aside from the well-known symptoms of cloudy vision, he describes nyctalopia as nearly always present. The patient saw better in dull

lights. The vision for near objects was always relatively more disturbed than distant vision. The light sense was always disturbed in the presence of absolute scotoma, and frequently in relative scotoma. This diminution of light sense was invariably greater after the pupil had been narrowed by eserine instillation, and vision was usually improved by dilatation of the pupil and made worse by contraction, which is directly opposite to the results in normal individuals. The typical form of scotoma was a horizontal oval extending from the fixation point to the blind spot. In absolute scotoma he found, like Groenouw, that there were two absolute scotomas, one at the fixation point, and one at the blind spot, connected by a zone of relative scotoma. This was found particularly in fresh cases or in improving cases. Green was first affected, then red, and the colors came back in the reverse order. Blue scotoma was present usually only when an absolute scotoma existed. (He describes the opposite condition in a case of sympathetic neuro-retinitis in which green was not affected, but there was a small scotoma of red and a large one for blue.) White was often called blue.

Marked concentric contraction of the field, with central scotoma points suspiciously to affection of the central nervous system, in addition to tobacco amblyopia. He corroborates Bernheimer's views as to the occurrence of blurring of the disc, with loss of the reflexes on the vessels, especially on the temporal side. The retina was also slightly veiled. These conditions were found in fresh cases while the pallor of the temporal half of the nerve appeared later and was absent in many (Uhthoff found no change in the papilla in one-third of his cases).

Treatment. — Complete abstinence, iodine and strychnia (subcutaneously in the temple in bad cases). Vision usually improved rapidly. For the better watching of the patient, he advises hospital treatment.

E. A. S.

ABSTRACTS FROM FRENCH OPHTHALMIC LITERATURE.

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Has the Ciliary Ganglion Any Role in the Production of the Aqueous?

LANDOLT, MARC (*Archives d'Ophthal.*, Mar., 1906) studies the influence of the ciliary ganglion in the secretion of the aqueous humor. In his experiments upon dogs he discovered that the extirpation of the ophthalmic ganglion does not bring about any appreciable retardation in the regeneration of the aqueous humor, after puncture through the cornea. He thus demolishes the opinion of Nicati, who places in the ophthalmic ganglion a center of secretory energy; and even unsettles the view of those who admit the existence of filaments having a function of an excito-glandular nature.

A Novel Entoptic Phenomenon.

BASLINI (*Archives d'Ophthal.*, Feb., 1906) describes as curious the following phenomena: After mounting rapidly a flight of stairs and gazing into the obscurity of a dark room he perceived a luminous spot or plaque which appeared and disappeared alternately, synchronous with the cardiac pulsations.

He explains this as due to the augmentation of the tension in the retinal arteries transmitted to the nerve elements of the retina and thence to the visual centers or those of light perception. The relation between the appearance and disappearance of the spot and the systole and diastole of the heart seemed to prove this.

(A condition of arterio-sclerosis, or at least some condition of increased arterial tension, would seem to be a necessary precedent; otherwise such entoptic phenomena would be common factors after any severe exertion.)

Pilocarpin in Ophthalmology.

BALLIART (*Bull. Gen. de Ther.*, Sept., 1906) gives a thorough review of the use of this salt in diseases of the eye. He first discusses the local use in cases of chronic glaucoma, and joins the ranks of those who regard it as of considerable value. But he becomes an ardent advocate of its constitutional use in many deep-seated diseases of the eye. He uses a solution of gr. 0.20 of the nitrate in gr. 10. of distilled water, i. e., 2%, employing this hypodermically in doses increasing from 6 to 10 drops; the latter equal to a centigram of pilocarpin. He has had favorable results in cases of interstitial keratitis, exudative chorioiditis, vitreous opacities, retinal hemorrhages, detachment of the retina, the fundus changes of progressive myopia and in toxic amblyopia. In fact, he claims that injections of pilocarpin are of benefit in all affections of the deep structures of the eye that are accompanied by infiltration or exudation.

He lays stress on the necessity of great care in making the injections.

On the whole, B. is more enthusiastic than Abadie himself, who first proposed the general use of pilocarpin in diseases of the eye as far back as 1875.

Action of Artificial Aniline Colors Upon the Conjunctiva. .

VOCR (*Archives d'Ophtal.*, April, 1906) gives the results of an elaborate series of researches upon the actions of the aniline colors upon the conjunctiva.

His experiments, made upon rabbits, embraced over 70 different colors. He came to the following conclusions: If a small quantity of an acid, neutral or mordant color, or colors insoluble in water, is placed on the conjunctiva, little or no inflammation of the mucous membrane results. If an equal quantity of a basic color is applied, intense inflammation, which may even lead to panophthalmitis, results. The various basic colors differ as to the intensity of the inflammation set up.

As regards relief, his experiments showed that the action of even the most caustic basic colors may be neutralized by irrigating the conjunctival cul-de-sac with a 5% tannin solution. While if solutions of sodium chloride, boric acid, or sodium bicarbonate (the very solutions most likely to be at

hand) are used; they only intensify the caustic action, and do more harm than if nothing at all be used.

These practical points are important, for with the modern development of the aniline industries, these accidents are becoming more frequent.

The Organic Silver Salts in Ocular Therapy.

BAILLIART (*Bull. Gen. de Ther.*, Aug., 1906) gives the results of his researches; mainly clinical. He finds protargol and argyrol to be efficient substitutes for nitrate of silver in the milder cases of ophthalmia. They have the advantage that they may with safety be put into lay hands for use; either the patient himself or his relatives or attendants. For this reason they will prove a valuable addition to our armamentarium, and render valuable service. Protargol is strongly bacteriacidal, while argyrol has practically no bacteriacidal action whatever; so that the former should be given the preference.

He concludes that, notwithstanding the pain and discomfort, and the practical drawbacks of nitrate of silver, it still remains the safest remedy in our hands in the graver cases of purulent ophthalmia. He thus draws back from the extreme position taken by Darier, and joins that large body of clinicians who are taking the middle ground.

Ossification of the Eyeball.

JACQUEAU (*Soc. des Sci. Med. de Lyon*, May, 1906; *Revue Gen. Ophthal.*, Sept., 1906) gives the report of the enucleation of a shrunken and painful eyeball in a woman of thirty-three, who had lost the sight in the eye at the age of fourteen; said to be as the result of a detachment of the retina. The globe presented a complete osseous sphere, with a central cavity; empty except for the disorganized fluid vitreous and detached retina. This shell was totally separated from the overlying sclerotic, except just in front of the ora serrata, where they were adherent.

Cases of ossification (or calcification) of the chorioid, with a fairly complete shell, are not so very rare. Some few cases with bone-like changes in the shrunken remains of the lens are also reported. This case seems to be almost unique among the reports in the completeness of the osseous sphere.

Luxation of the Eyeball in a Forceps Delivery.

HERMITTE and SALVA (*Dauphine Medical*, Feb., 1906; *Revue Gen. d'Ophthal.*, Sept., 1906) reports the luxation of the left globe out of the orbit, in a forceps delivery, with contracted pelvis. It was evidently not a direct luxation by the forceps blade, for it began an hour after the delivery and only became complete in twenty-four hours. There was a marked depression of the left parietal and frontal bone.

The extreme chemosis was dark and glazed; the lids were contracted behind the globe; and the cornea was dull and roughened. The chemosis was incised to permit the reduction of the globe, and this was maintained by suture of the eyelids. The corneal infiltration cleared slowly, a central macula remaining. Vision was preserved, except as this opacity impaired it.

The authors thought that the compression of the head had caused a hémorrhage into the orbit, at the level of the muscle bundle; and the pressure of this from behind had brought about the protrusion.

Two Cases of Blepharospasm Cured.

SPEVILLE (*Clinique Ophthalmologique*, May, 1906) reports two cases, cured by two different methods.

The one was by an injection of 1 cc. of 80% alcohol at the point of exit of the facial nerve. [This method was given in these abstracts in these ANNALS of last July, p. 482.]

The other was by the section of the facial, and the junction of the peripheral end onto the external branch of the spinal-accessory. This method causes some interference with the arm muscles, and their associated movements with those of the face.

The first method is preferable; and only upon its failure need the radical second method be tried.

Cure of Palpebral Epithelioma by the Thermo-Cautery.

LEROUX (*L'Ophthalmologie Provinciale*, June, 1906) reports a case of epithelioma of the lower lid cured by applications of the thermo-cautery. It was an ordinary shallow lid epithelioma ("rodent ulcer"), in active ulceration; oval in shape; and about 15 mm. x 20 mm. in size.

The cauterizations were repeated once a week, and at the end of six weeks the healing was complete. Local anesthesia mitigated the pain very materially. Seven months later there was still no recurrence.

LeRoux thinks that the thermo-cautery forms an excellent substitute for the X-ray, or for radium; especially as these are so seldom available to one not specially outfitted. The results are promising in cutaneous epitheliomata, provided there is no neighboring glandular enlargement; and provided also that the ulcer is not too extensive, nor too deeply infiltrated in base or edges, nor growing too rapidly.

Tarsorrhaphy in Certain Ocular Traumata.

MONTHUS (*Archives d'Ophthal.*, Jan., 1906) reports seven cases of penetrating wounds of the sclero-corneal junction, five of them being in children. The lids were sutured together (only the central portions being united), and were kept occluded for two weeks at least. In four the results soon were so excellent that the procedure merits further trials. It should be done as soon after the accident as possible; before external infection. Contraindications are: a foreign body in the eyeball; a wounded lens; or a rapidly developing infectious keratitis.

Ocular Metastatic Complications in Gonorrhea.

LEMIERRE and FAURE-BEAULIEU (*Gaz. des Hop.*, Feb., 1906), in the course of an extensive and exhaustive paper on general gonococcal infection, give a concise account of the ocular affections of a metastatic nature, with descriptions and reference to cases. These include gonorrheal metastatic conjunctivitis (Moll), dacryo-adenitis (Terson), episcleritis or Tenonitis (Puech), iritis (Lapersonne), irido-chorioiditis and neuro-retinitis (Galezowski), retinitis, and panophthalmitis (Panas).

The authors regard these affections as true metastases, although the bacteriological proof is lacking or questionable in practically all the examples so far reported. But they are always associated with a systemic gonococcal septicemia; and improve and disappear with its relief and cure. They occasionally recur, with a recurrence of the gonorrhea; and in

rare instances settle into a chronic stage, with the subsidence of the gonorrhea into chronic gleet.

Orbital Cellulitis Following Frontal Sinusitis.

LAFON (*La Clinique Ophthal.*, March, 1906) reports a case, female aet. 27, with an interesting pathological chain. She had first suffered from an acute coryza; following this there developed an acute empyema of the frontal sinus; this in turn was followed by orbital cellulitis, and this was accompanied by an optic neuritis of decided type. V. ran down to 1/20.

A deep puncture was made at the upper inner-angle of the orbit, back into the orbit. This evacuated no real pus, but abundant bloody serum. This fluid showed staphylococci and pseudo-diphtheritic bacilli.

The cellulitis subsided, and V. rose to normal.

A Sub-Conjunctival Lipoma With Reflex Symptoms.

BOURGEOIS (*Ophthalmologie Provinciale*, p. 178, 1906), reports two cases of ocular tumors. The first was an ordinary dermoid of the cornea; of no special interest except that the excision was supplemented by electrolysis. The other was a sub-conjunctival lipoma occupying the outer portions of the superior cul-de-sac. For two months this patient had been subject to blepharospasm and convulsive tic of the same side of the face. The remarkable part was that with the extirpation of the tumor these symptoms had disappeared. This result would seem to prove that they were reflex in nature; but what the anatomical connection was is not clear. We are not prone to admit that blepharospasm may be hysterical; but, if it were, the above operation would be certainly one sufficient to produce the needed psychic effect.

Transitory Ectasia in Kerato-Conus.

TERRIEN (*Archives d'Ophthal.*, Jan., 1906) reports a case of double kerato-conus of long standing, in which there had come on suddenly a considerable diminution of the vision of the right eye. There now presented a circumscribed ectasia limited to the central area of the conus. The surface of this ectasia was dull and slightly opalescent, while the periphery of the cornea remained normal. T. explained the con-

dition as due to the rupture of Descemet's membrane at the summit of the conus, permitting the infiltration of the cornea by the aqueous, and its consequent distension. He employed median tarsorrhaphy, with gradual and complete cure of this secondary ectasia. This he attributed to the cicatrization of Descemet's membrane, permitting the re-establishment of the previous curvature.

Megalocornea, Inversion of Corneal Axes, and Oxycephalus.

PATRY (*Annales d'Oculistique*, April, 1906) reports a rare case in a youth of 17; with an oxycephalic conformation of the skull, cornea larger than normal, and presenting an oval with its longer axis vertical instead of horizontal. Corrected V. was normal. The only other recorded case with inversion of the corneal axes was Hirschberg's case, in which there was also megalocornea, with infantile glaucoma. P. is of the opinion that in his own case the megalocornea and inverse axes were congenital, while the oxycephaly was acquired. Thus the presence of the two conditions in the same individual was simply a coincidence.

Phlyctenular Kerato-Conjunctivitis; Glaucoma.

GALEZOWSKI (*Recueil d'Ophtal.*, May, 1906) reports the case of a confrere, Dr. B. A phlyctenular kerato-conjunctivitis treated locally without results for many months had ceased in a few days with the treatment of the lacrimal condition. Some time later he had returned with a glaucomatous attack in the same eye; probably due to the influence of a gouty general condition. After no success with local medical treatment an iridectomy was proposed and was refused. The local medical treatment was then continued, concurrently with an anti-gouty and hygienic treatment scrupulously followed out.

The condition was ameliorated little by little and the patient finally cured.

Monolateral Hippus With Oculomotor Paralysis.

AURAND and BRENIL, (*Archives d'Ophtal.*, p. 74, 1906) report the case of a little girl with paralysis of the third nerve of the right eye; who presented in addition very slow and regular alternate dilatation and contraction of the pupil. Each of these movements lasted fifteen seconds, and was independent

of all causes capable of modifying it, such as phenomena of a psychic or sensorial order. The pupil varied from 1 to 6 mm. in diameter.

After a bibliographic review of the question, the authors reach the following conclusions: There exist four classes of pathological hippus: 1st. Hippus by hyperexcitability of the nervous centers, a sort of ataxia of the pupil as studied by Damsch in various maladies of the nervous system. 2d. Respiratory hippus, which Roch explains by the action of the respiration on the circulation, and then of the circulation on the iris and the pupil. 3d. Hippus of paralyses on the way to recovery. 4th. Rhythmic hippus, which one may comprehend as a sort of autonomous action of peripheral iris centers acting independently.

This case would seem to come under the third and best understood group.

Relation of Accommodation to Strabismus: Its Correction by the Diploscope.

REMY (*Recueil d'Ophtal.*, p. 149, March, 1906) gives two cases illustrating the influence of accommodation upon squint. The one was an ordinary case of alternating strabismus which disappeared upon correction of the hypermetropia, in conjunction with exercises with the diploscope. In the other case squint came on when the eyes accommodated. Here the exercises with the diploscope brought about a correction.

He regards the diploscope (a modification of the stereoscope) as an excellent means for the correction of strabismus and the re-establishment of binocular vision.

Intravenous Injections of Sodium Sal. in Rheumatic Iritis.

SANTON (*La Clinique Ophtal.*, June, 1906) gives his results in the use of sodium salicylate, by intravenous injection, in rheumatic diseases of the eye. He uses this method as a routine treatment in rheumatic iritis, episcleritis, and kerato-scleritis.

He claims that this method is more active, prompter and more permanent on the one hand, and on the other hand less likely to bring about digestive troubles, aural complications, etc., than by the method of oral (or even hypodermic) administration. He regards albuminaria and pregnancy as distinct contraindications.

He uses the following formula:

Sod. Salicylat	5.00
Cafein	0.50
Aquæ Dest. et Ster.....	25.00

He injects this at such times and in such quantities as to give 50 to 60 cgr. ($7\frac{1}{2}$ to 9 grains) of the salicylate itself each day.

He claims such good results that the method deserves wider trial. [The general claims and technic of this method are given in a translation from Darier in the *ANNALS OF OPHTHALMOLOGY* of January, this year.]

Nature of the Degenerative Changes in the Lens Fibers.

TOUFESCO (*Annales d'Oculistique*, April, 1906) gives a preliminary report of researches on the nature of the degenerative changes occurring in the crystalline fibers.

He concludes: 1st. That we have in senile cataract a fatty degeneration of the crystalline fibers—the fibers are broken up into fibrillæ, and then transformed into a homogeneous mass honeycombed by vacuoles.

2d. These vacuoles represent the spaces occupied by the fatty droplets and left after their dissolution by the re-agents.

3d. The fatty degeneration is observed to begin toward the equator of the lens.

Operation for Traumatic Cataract in a Case of Iridiremia.

FRENKEL (*Recueil d'Ophthal.*, Feb., 1906) reports a case of interest, due to the rarity of cataract operations in congenital aniridia. In this case, this was further complicated by trichiasis and resulting conjunctivitis; and by the fact that the cataract was of traumatic origin and was associated with a corneo-lenticular band. The other eye was blind.

There was a long preparation of the patient, during which canthoplasty and epilation were both made. The discharge was suppressed before the operation was made.

The result was good, although not exactly stated; the statement was that he could tell the time by his watch.

Glioma Retinae: Successful Enucleation.

SPEVILLE (*La Clinique Ophtalmologique*, March, 1906) reports a case to go among the fairly certain recoveries. The

glioma was seen very early, in the left eye of a young child, and while central vision was still good. The eyeball was removed by simple enucleation; the remaining orbital contents not being disturbed.

Examination showed a small tumor, the size of a pea; and microscopical examination showed it to be unquestionably a glioma, still confined to the retina.

The child was well, with a healthy socket and no recurrence, seven years after the operation.

Prognosis and Treatment of Glioma.

ROCHON-DUVIGNEAUD (*La Clinique Ophtal.*, Mar., 1906) discusses this question at some length. While sarcoma has less tendency to invade the orbit and tends more to spread by metastasis, glioma is exactly the reverse. Therefore gliomas present the greater urgency for early operation. In operating consent should always be first obtained to make a radical evisceration of the orbit if it should be found advisable, thus making but a single operation. After the simple enucleation the gross appearance of the cut end of the optic nerve (or its appearance under a hand magnifier) will afford information sufficiently accurate to determine whether simple enucleation will suffice. If it remains white and of normal size, this will be sufficient, without cleaning out the orbit. But if it is shrunken, even though of normal color; if discolored, even though of normal size; if enlarged and discolored a dirty gray, or even with a dirty gray zone around the central vessels, the orbit should then be eviscerated at once.

As regards prognosis, he holds that two years' freedom from recurrence renders the case safe—a shorter period than some other observers require.

He is convinced that the *great majority* of gliomàs, if seen early enough, can be cured by a prompt and radical operation.

Retinal Hemorrhages in Adolescents.

THILLIEZ (*Jour. des Sci. Med. de Lille*, Feb., 1906) reports two cases of this character; one a young man of twenty-three, with a large hemorrhage in the macular region, and the other a young man of twenty with a subretinal hemorrhage at the macula.

T. found the same etiological factors in both subjects: An overtaxed physique, with the auto-intoxications which this permits; some cardiac hypertrophy, with resulting embarrassment of the return circulation in the recumbent position; and deficient respiratory re-oxidation. Probably exaggerated efforts at accommodation or convergence and continued slight compression of the vessels of the neck had led to such vascular interferences that hyaline thrombosis had resulted in exudation of blood from the chorioidal or retinal system.

Macular Hemorrhage and Optic Atrophy During Lactation.

LOBEL (*Recueil d'Ophthal.*, Jan., 1906) reports the case of a woman, aet. twenty-seven, in whom an optic neuritis and macular hemorrhage came on coincident with the arrest of the lacteal fluid at the tenth month of lactation. Shortly after there was a profuse metorrhagia which lasted fifteen days. The hemorrhage cleared up, but there was not a corresponding improvement in vision owing to the optic atrophy that slowly supervened.

L. cites similar cases, with diverse explanations, of Himly, Cohn, Heinzel and Rogman.

The complication usually occurs suddenly, and generally near the beginning of lactation. Sometimes it is accompanied with cerebral symptoms. But generally the prognosis is good. The treatment depends on weaning the child at once.

Neuritis Post-Rubeola.

DE VANCRESSON (*Annales d'Ocul.*, Mar., 1906) observed a case of optic neuritis supervening during the course of the convalescence after measles. The particulars of the case were as follows: The blindness came on rapidly (in less than eight days), and seven weeks after a white atrophy of the optic nerve was complete; the affection remained monolateral; the examination of the cerebro-spinal fluid was not made, but De V. thought that there was a certain degree of meningeal irritation, because the patient for several days had complained of a violent frontal headache. However, this hypothesis of an infection by way of the meninges need not exclude that of a direct toxic involvement.

Trochlear Paralysis in Diabetes.

CASSIN (*Bull. de la Soc. Med. de Vaucluse*, p. 336, 1905-6; *Rev. Gen. d'Ophthal.*, July, 1906) reports the history of a woman of seventy-two, who had been diabetic for six years. She passed three liters of urine, containing thirty to forty grammes of glucose to the liter. General state of health was, however, very good. She suffered from some attacks of vertigo, without loss of consciousness; and on the fifth day diplopia came on.

The media were clear; no iritis; and the fundus was normal. The image-tests showed a paralysis of the fourth nerve. Similar cases by Pansier and Valude are quoted. There was absence of the peri-orbital pains mentioned by Dieulafoy.

The condition did not disappear until six months after.

Diabetic Neuralgia, Neuritis and Ophthalmoplegia.

INGELRANS (*Gaz. des Hop.*, Mar., 1906) made a general study of diabetes neuralgia and neuritis; with a section on the ocular manifestations of diabetic neuritis and resulting ophthalmoplegias.

He reviews the recent article by Dieulafoy and the thesis of Paloque (Lyon, 1905). Among 150 diabetics (Schmidt-Rimpler) ten presented ocular complications; and of these cases four were case of ophthalmoplegia. Of these the most frequent is paralysis of the abducens (sixth).

While not always due to a peripheral neuritis, this pathology must be admitted. On the other hand the diabetic paralyses that are grave and persistent are nuclear in origin. The minute hemorrhages are due to toxic products of faulty metabolism circulating in the blood.

Oculo-Motor Paralysis and Hysteria.

JOSSERAND (*Soc. des Sci. Med. de Lyon*, Jan., 1906; *Rev. Gen. d'Ophthal.*, Sept., 1906) reported the case of a woman with paralysis of the third, right side. A very careful examination, showing old nervous crises and areas of anesthesia, led one to suspect hysteria. The diplopia, strabismus and ptosis had come on rapidly in the course of a few days, after severe periorbital pains. There was hyperesthesia of this region and slight exophthalmos. The diplopia was not alone binocular, but was also monocular with the affected eye. There was

megalopsia with this eye. J. thinks that the hysterical phenomena were superadded to the organic paralysis of the third; and that a localized lesion, in a hysteric, tends to fix the neuropathic symptoms in the affected zone.

Lumbar Puncture in Ocular Affections.

GODTS (*Arch. Med. Belges*, Mar., 1906) gives a study of the operative technic of lumbar puncture. Quincke advises to pass into the second or third interlaminar space, 5 or 10 mm. to the right or left of the median line. Chipault, between the fifth lumbar and the first sacral vertebrae. Tuffier, between the fourth and fifth lumbar vertebrae. G. inclines the trunk and punctures in the median line immediately below the fourth lumbar apophysis. There have been many applications of this lumbar paracentesis for the cure of optic neuritis, based on mechanical theories of the affection. G. has not personally witnessed any amelioration. The slight improvement of vision, which some cases have secured in the beginning, has not been maintained. It is directed, above all, to the old cases of alcoholic neuritis.

Bilateral Homonymous Hemianopsia.

DEBRAY (*Jour. de Neurologie de Brux.*, Jan., 1906) reviews the question of hemianopsia, with special reference to those cases in which the field blind for form (objects) still retains the perception of light.

He sums up the various explanations for this phenomenon, the last being his own. 1. There are degrees of hemianopsia, the milder forms corresponding to loss of color perception and the sensation of the form of objects. The more profound alterations bring about the loss of the sensation of light. These modifications of vision are due to the varying activity of the cortical cellules at the occipital pole (Bard).

2. In the cortical area there are special centers for the diverse retinal functions, and there may be present an involvement or an escape of certain of these independent of the others (Wilbrand).

3. One is obliged to admit, for this retention of the sensation of light and darkness, the existence of homolateral retinal fibers, charged with this obtuse sensibility (Morat).

4. The cells of the occipital lobe in general are qualified to perceive the luminous impressions; but those which occupy the occipital pole are especially capable of distinguishing the form and the color of objects, because these are more directly in connection with the retinal cones at the fovea. All the occipital lobe is qualified to receive the sensation of color. Thus the retention of the sensation of light and darkness in a case of destruction of the calcarine zone is not the result of the insufficient alteration of this zone; but that the portion of the occipital area that remains intact can itself appreciate the sensation of light (Debray).

SOCIETY PROCEEDINGS.

SECTION ON OPHTHALMOLOGY. COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting February 19, 1907. Dr. Howard F. Hansell, Chairman, presiding.

Dr. Burton Chance reported *A Case of Electric-Light Burn of the Eye, with Transient Blindness*. The subject was a scientific experimenter, who had been studying strong lights at short distances for several hours. He had not used shades or protecting glasses. The first signs consisted of scotomas, with halos about lights and increased redness of flames known to contain red elements, while the eyes and lids felt parched. Several hours later there were sudden, intense pain, photophobia, lacrimation with swelling of the lids, and blindness. There were superficial burns of the lids, edema, and chemosis; and on the corneas were several small blisters, which later became resolved into colloid masses and were then absorbed. The retinas were edematous and the fundus tint was grayish, becoming later on of a veiled orange color. The sight was not restored until the fourth day; there were no unusual peripheral visual disturbances, though the retinas were painfully sensitive to electric-arc rays. For a space of three weeks the eyes remained perfectly normal. Then, after excessive exposure, many of the symptoms returned. The color fields were contracted, though no scotomas could be detected. The treatment in the first attack consisted in rest in a darkened room and the use of hot anodyne lotions; while in the second, atropin was used daily and the patient was sent to the country. After two weeks the retinas appeared healthy, and the visual function was completely restored.

Dr. Hansell said he thought the burn in such a case must be very similar to that caused by the use of the X-rays. He had examined a case in which a growth on the conjunctiva was being treated by X-rays, and found a dense opacity of

the cornea which had gradually spread until nearly the whole cornea was involved. Dr. Ziegler reported a case in which the injury was due not to exposure to a steady light, but to the accidental crossing of two electric wires. Ophthalmoscopic examination showed an edema of the retina. There was marked *anesthesia retinae*, which persisted for more than a year, and made him fear optic atrophy. Visual acuity, however, had returned, and there was complete recovery.

Dr. George S. Crampton reported *A Case of Epithelioma of the Sclerocorneal Limbus*. The growth had appeared without previous injury to the cornea, and had grown slowly until in sixteen years it had invaded about two-thirds of the surface of the cornea, and a somewhat smaller extent of the conjunctiva. It was dense and very slightly raised above the eyeball, its surface being finely papular, and of a pinkish ivory color.

Dr. Shumway spoke of the exceedingly slow extension of the growth and the very slight involvement of the deeper layers of the cornea, as shown by the microscopic sections. Such growths were usually to be distinguished clinically from pure papillomas by the fact that they were sessile, whereas the papillomas possessed a pedicle.

Dr. Howard F. Hansell presented a paper upon *Trachoma, Clinically and Socially Considered*. He alluded to the introduction of trachoma into European countries by the returning armies of the Italian, French, and English in the beginning of the eighteenth century, and its subsequent widespread dissemination. Its virulence and its prevalence are not the same among all nations, but increase in direct proportion to the conditions that favor its spread and development. The contagiousness of trachoma cannot be doubted. Its unsuspected admission into schools, educational and reform, into barracks and ships, into benevolent institutions, into private families, and the infection of from 50 per cent. to 75 per cent. of the inmates, are conclusive. It is admitted that the contagion is resident in the secretion and that the disease is communicated by contact of the secretion, whether fresh or dried, with an hitherto unaffected conjunctiva. Hence, those forms are most contagious that have the most abundant secretion. After trachoma has reached the third

stage the secretion, characteristic of the disease, has disappeared.

The U. S. government has included trachoma among "dangerous contagious diseases" and all immigrants are subjected to a rigid examination of their eyelids. The question arises as to the justice of the Act in the exclusion of *all* trachomatous individuals. If all cases are dangerous and contagious, the officials whose duty it is to carry out the law have no choice, but if it is admitted that the contagiousness is limited to the first and second stages, it would seem that the law should be interpreted to apply to those stages only.

The discussion on this paper was opened by Passed Assistant Surgeon Taliaferro Clark, of the Public Health and Marine Hospital Service (by invitation). Dr. Clark said that the cause of trachoma is still unknown, despite the immense amount of work that has been done upon the subject. The organisms, whatever they be, are only conditionally contagious, as the disease does not always affect all the members of one family. He distinguished three stages: (1) an acute one, associated with trachoma bodies, the size of which differed according to their position in the conjunctiva, to the severity of the infection, and to the resisting power of the individual; (2) a connective-tissue stage, and (3) the stage of contraction. In the Marine Hospital Service the cicatricial changes were considered the most important in diagnosis, and acute cases were held for a week to see if such were present after the catarrh had subsided. In the third stage he did not consider the disease was contagious, but he did not agree that in such cases there was no danger to eyesight. The pressure of the distorted lids, particularly in elderly people, and the production of pannus tissue and ulceration of the cornea were followed by blindness in 75 per cent of the cases which were untreated. The diagnosis was more difficult among immigrants than in the ordinary hospital clinics, because of the systematic use of such applications as adrenalin and various caustics among the infected individuals, in order to improve the local conditions before starting from foreign countries, and even on shipboard. It was therefore often a difficult decision to make in the short time allowed.

In government work, as a result largely of a paper read by

Myles Standish in 1897, the law is now mandatory that all cases of trachoma are to be deported, because of the danger of infection to others and of blindness to the individual. The certificate of the Marine Hospital Service cannot be contested by a physician, but an appeal may be taken to three physicians in the service. This ruling is necessary in order to prevent the nullifying of the decision of the government's official by a physician who may not have had proper training.

Prior to the passage of the law many thousands of infected individuals gained entrance to the country, joining centers already formed, and starting new foci of the disease. New cases are constantly appearing, probably as the result of infection during the passage, although symptoms are not evident on admission. Efforts are now being made to prevent the formation of new foci, and investigations by Dr. A. E. Davis, of New York, have shown recently that the percentage of trachoma cases in the various cities has been reduced from 4 to a little over 2 per cent since the law was passed. The disease, therefore, may in time be eradicated from the country. Four per cent of the blindness in the United States is due to trachoma. It has become a menace to the children in the public schools of our large cities, although the number of cases reported is believed by some to be greatly overstated, many cases of follicular catarrh having been included by mistake. Dr. Clark referred to the establishment of trachoma hospitals in New York City. In the first one founded, 4827 cases had been treated in nine months' time. There were one hundred and fifty inspectors employed to examine the school-children, and for the nine months' time the hospital had been conducted at a cost of \$27,000. Good results, however, were evident in the reduction of the number of children affected.

Dr. W. L. Pyle did not believe that a positive diagnosis of trachoma could be made in the first stage, and he was in hearty accord with Dr. Clark's conservative attitude of delaying a definite opinion until the connective-tissue bands of the second stage were clearly discernible. He did not believe that cases of trachoma in the third stage were infectious, and he thought that immigrants who could meet the financial requirements and who were vouched for by reputable American citizens might be safely admitted in the final stages of trachoma.

If there was reasonable assurance that they would not become public charges in case of ensuing blindness, he did not think the rigid enforcement of the exclusion laws was justifiable. In a survey of the literature relative to the great prevalence of trachoma in the large cities of the world, he was struck by the comparative infrequency of this disease in Philadelphia. In private practice true trachoma was practically unknown, and after more than ten years' experience at Wills Eye Hospital he would pronounce it a comparatively rare ophthalmic affection. Of course, in every locality many analogous cases of conjunctival disease are loosely classed with true trachoma, and this will likely account for some of the startling figures published. The term "granular lids" is generally used in common parlance to describe all forms of chronic conjunctivitis.

Dr. Clark said that cases in the third stage of trachoma were always certified as in danger of blindness.

Dr. S. Lewis Ziegler read a report of *A Case of Keratitis Tuberculosa Treated by Tuberculin*. The right eye was affected, the nodes being located in Descemet's membrane. In the onset the case closely resembled interstitial keratitis, the salmon-colored patch and vascularized marginal ring being present. Later, isolated tuberculous nodules appeared.

For two months tuberculin injections of 3 to 5 minims had been administered once or twice a week. There had been a local reaction twice, and a systemic one three or four times. Improvement had been slow, but steadily progressive, and the patient was now rapidly convalescing, although the central opacities in Descemet's membrane would doubtless interfere permanently with good central vision.

Dr. S. D. Risley recalled to the members of the Section a case which he had reported in October, 1905, as tuberculosis of the conjunctiva. The patient had been treated with tuberculin, and the first three injections had been followed by such sharp reaction that it was considered imprudent to repeat them more than once a week. The two subsequent injections had produced only a moderate reaction. There had been a rapid improvement, not only in the local condition, but in the general health of the patient.

Dr. William Campbell Posey reported a case of *Coloboma*

of the Lid, with Anomalous Condition of the Tissues at the Outer Commissure, occurring in a girl aged ten years. The child was otherwise healthy and there was no history of a similar deformity or anomalous cleft in other structures in other members of the family or ancestry. The coloboma, which was situated on the upper lid of the left eye, was so formed that when the eyes were directed straight forward, the cornea fitted exactly into the aperture in the lid, the outline of the coloboma being rounded in precise conformity with the corneal limbus. The cornea was clear. At the outer angle of the eye there was a marked thickening in the tissues which seemed to be dependent upon some anomalous formation in the capsule and the reflection of the fascia to the rim of the orbit. The bulbar conjunctiva covered this mass, which was grayish white in color and everywhere smooth and flat. Externally the mass was lost in the tissues of the commissure, but internally it was bound down to the globe by a sharp line of demarcation. Dr. Posey said that up to this time but 125 cases of coloboma of the lid had been reported in the literature; that the fissure in the reported cases, as in his case, is generally triangular in form, with its base at the edge of the lid, in most cases the edges being rounded, the angles being sharply delineated but rarely. While in most instances the space left between the pillars of the coloboma is free, in others bands of embryonal cutaneous tissue traverse the gap, and, as in the classic case of Nuel, this band may be attached to the cornea, giving rise to a peculiar kind of symblepharon, which may cause marked restriction in the movements of the globe. The chief interest to the writer lay in the correction of the defect, for which he proposed to operate. He proposed to first separate the skin at the edges of the coloboma from its sublying tissues and then to perform an external canthoplasty to lengthen the fissure and relieve the tension upon the lid. After this procedure the lid will be everted and the cartilaginous edges of the wound carefully approximated by fine sutures. The line of division between the cartilages will be covered externally by two sliding flaps which will be obtained from the lid.

Dr. Posey said that he had seen the curious anomaly in the outer commissure of the eye in one other instance. He did

not believe that the mass was a dermoid, but attributed it rather to a saccular dilatation of the capsule and fascia which go to form the external check ligament.

Dr. Pyle called attention to a curious case of almost total double superior ablepharia in an infant under his observation about two years ago. At this time operative interference was not deemed advisable.

Dr. Posey also reported a case of *High Myopia* in a Hebrew girl, aged sixteen years, in whom removal of the lens had been successfully performed by discission. Both eyes were myopic (-18 D.). There were large staphyomatous areas surrounding the disks, but the vitreous was clear, and despite some disturbance of the pigment in the macular regions, no scotoma could be outlined in the visual fields. The right lens was cautiously needled upon three occasions. Five months after the primary discission, vision in the operated eye equaled 6-24, without a glass, and with $-S. 2.75$ D. it was brought to 6-9. Type 0.75 D. was read without difficulty at thirteen inches.

Regarding the degenerative processes which many claim still continue after the lens is removed, Dr. Posey referred to the statistics of Huber, who based his observations upon one hundred eyes upon which Haab had operated for high myopia. This author found that macular changes developed in 14.67 per cent of the operated and only in 7.02 per cent of the unoperated eyes, although the vision was thereby impaired only in a minority of cases. Opacities in the vitreous, retinal hemorrhages, and retinal detachment all showed a similar tendency to renewed frequency after the operation. Font-Reaulx, in a very comprehensive paper, also discredits in a measure the value of the operation, pointing out the dangers of its inefficiency in checking the myopia. Despite these pessimistic views, however, Dr. Posey believed that the operation should be performed in selected cases, and was of the opinion that if the discission be performed cautiously and not too extensively the danger is not so great as many would have us believe.

Dr. S. D. Risley said that when the operation was first proposed he had expressed the opinion that the pathological conditions present in eyes with high myopia would make opera-

tive procedures dangerous, and later statistics had seemed to bear out his opinion. Retinal detachment had been especially frequent, and he therefore considered the operation justifiable only in selected cases, and then very cautiously, until the temper of the eye could be learned. Traumatisms to an already diseased eye are very dangerous, and the changes present in the macular region are by no means checked by operation.

Dr. Pyle remarked on the gradual change of sentiment as to the value of removal of the crystalline in high myopia. He had never deemed the operation a sound or safe surgical procedure, and expected to see a progressive diminution in the number of such patients operated. After repeated requests from advocates of the operation for definite indications for its employment, he was generally met by a list of conditions when it was positively contra-indicated, and given such vague answers for its indications as "certain selected cases," etc. There was no established consensus as to when to operate.

Dr. Risley said that by selected cases he meant those in which no fundus changes were present.

Dr. Ziegler reported a case in which one eye was blind, while the other showed high myopia, with retinal detachment. Posterior sclerotomy was performed, tapping the fluid beneath the detached retina and the retina returned to its normal position. Subsequently the lens became opaque, and was operated upon by discission. The resulting vision was good.

Dr. Hansell gave the subsequent history of the case reported before the section a year ago, in which there had been repeated retinal hemorrhages. For a year after operation there had been no recurrence of the hemorrhages, and the man returned to his work. Lately, however, there had been a return of the hemorrhages. The vision had remained about 20-70, and the myopia had not increased. These hemorrhages had not been the result of the myopia, apparently, but of the general condition of the patient. The coagulability of the blood was only one-fourth of normal, and systemic treatment to combat this had not prevented the occurrence of the hemorrhages.

Dr. Posey, in closing the discussion, said that the number of cases in which operation is advisable is probably less in this country than abroad. In his experience the majority of pa-

tients with high myopia were to be found among the Hebrews and Irish. Dr. Posey would not operate if satisfactory and comfortable vision could be obtained by glasses, and as the correction of refractive errors was more carefully done here than on the Continent, this factor would reduce the number of cases requiring operation. He would operate, further, only in young subjects, in the presence of a myopia not less than 16 D., and only when no serious fundus changes existed. He did not consider a moderate chorioiditis a contra-indication. The operation of choice was discission, the needle being introduced near the limbus, and the lens cautiously incised, so as not to disturb the zonula of Zinn.

Meeting March 19, 1907. Dr. Howard F. Hansell, Chairman, presiding.

Dr. Mary Buchanan (by invitation) reported *A Case of Amaurotic Family Idiocy*. (Published in full page 249.)

Dr. Hansell spoke of the cases of atypical amaurotic family idiocy which had been recently reported by Dr. Alfred Gordon before the College of Physicians. They were of Jewish extraction, and twelve to fourteen years of age. They were slow in school and showed a mental development no greater than children of three or four years. One had an extra finger and an extra toe on each extremity. They differed essentially from the typical case which Dr. Buchanan had shown, and Dr. Gordon thought they were best classified as cases of modified amaurotic family idiocy.

Dr. John B. Turner reported a case of *Acute Superior and Inferior Polioencephalitis* in a woman aged fifty-one years. The third cranial nerve was first involved, and the lesion extended downward, involving the fourth, sixth, ninth and tenth nerves. At no time were the fifth, seventh and twelfth nerves affected. The unusual feature of the case was that after the ophthalmoplegia externa had existed for twenty-five days bulbar symptoms developed and death occurred three days later. Unfortunately no autopsy was allowed.

Dr. de Schweinitz referred to three cases of polioencephalitis which he had recently studied in so far as their ocular symptoms were concerned. In one, a boy aged sixteen years, under the care of Dr. Langdon, in addition to ptosis and loss of upward movement of the eyeballs, there was a retrobulbar

neuritis, with central scotomas. In the second a boy aged eight years, there had been primarily complete external ophthalmoplegia of the right eye and partial ophthalmoplegia of the left eye. Gradually there was recovery of all the muscles involved with the exception of the left external rectus, which remains paralyzed, and a paresis of the right external rectus. In the third case the patient was not investigated until long after the subsidence of the general symptoms. All ocular movements had recovered, but in each optic nerve there was a small patch corresponding to the area of the papillomacular bundle, of atrophic appearance, and it is probable that during the height of the disease the patient had an axial neuritis, not unlike that noted in Langdon's case. During a portion of the period of the illness of the second child there was a moderate optic neuritis, or, more accurately, congestion with edema, which has entirely subsided.

Dr. H. M. Langdon (by invitation) gave the details of the case under his care to which Dr. de Schweinitz had referred. A young man, aged nineteen years, had been in good health except for an attack of la grippe four week before. Vision had failed suddenly and was reduced in three days to 1-10 in one eye and 1-35 in the other. In both eyes the nerve heads were decidedly hyperemic. The fields were greatly contracted and color perception was lost. Upward movement of both eyes was abolished, there was slight ptosis, and the eyeballs were tender when pressed backward. The knee-jerks and station were normal. A tentative diagnosis of acute retrobulbar neuritis was made, and the patient admitted to the hospital. Vision was rapidly reduced to zero, and marked general prostration appeared, with intense headache. He was seen by Dr. Wm. G. Spiller, and a diagnosis of acute polioencephalitis given, with a favorable prognosis. Under treatment the vision rose to normal, the eyeball movements returned, and the scotomas disappeared. At the last examination there was a pallor of the temporal halves of each nerve, but vision had remained full.

Dr. Howard F. Hansell reported *Two Fatal Cases of Orbital Cellulitis*. (Published in full, page 256.)

Dr. Chance stated that he had reported two cases of *Orbital Cellulitis as a Sequel of Scarlatina* about four years ago. The local symptoms were somewhat like those in Dr. Hansell's

cases. The contiguous sinuses were healthy and no pus was found when the swollen tissues were incised. Each case was fatal. Autopsy of one was allowed, but nothing specific was found. The cellulitis was supposed to have been produced by thrombotic processes in the ophthalmic vein and the communicating vascular sinuses.

Dr. de Schweinitz, referring to the first case reported by Dr. Hansell, thought it possible that the phenomena had been the result of thrombosis of the cavernous sinus rather than of cellulitis of the orbit. All of the symptoms detailed—the proptosis, intense edema of the eyelids, chemosis of the conjunctiva, anesthesia and necrosis of the cornea, and fixation of the eyeball—were the well-known symptoms of this affection, which might have arisen from any infected lesion in the area drained by the ophthalmic vein or its branches. Moreover, a septic thrombosis in this sinus could very well have been the starting point of the pneumonia which subsequently developed. Against this diagnosis, as Dr. Hansell pointed out in his paper, was the presence of erysipelas of the arm and back, which followed and did not precede the orbital symptoms. In the absence of a post-mortem, however, this diagnosis could remain only as a suggestion.

Dr. Hansell said that the diagnosis which Dr. de Schweinitz suggested had been considered as a possibility, but the rapid development of the erysipelas of the body had led him to think the original condition was erysipelas of the orbit.

Dr. Krauss reported a case of *Embolism of the Cilioretinal Artery* occurring in an eighteen-year-old school-girl. There was present a mitral murmur, and before ether anesthesia for the removal of a large adenoid an added faint presystolic murmur was ascertained. The vision was 5-30 eccentric, in the right or affected eye, and 5-4 in the left eye. Two weeks later the vision was 5-4 in each eye. The large scotoma first evident became gradually much smaller and now occupies a small section from near the fixation point to the 10° line at the temporal side.

The treatment consisted of deep massage, nitroglycerin gr. 1-100 every three hours, and absolute rest of the eyes.

Dr. Krauss also reported a *Case of Persistent Hyaloid Artery and Canal of Cloquet*, which presented the appearance of

broad, dense bands extending from the extreme periphery of the nasal edge of the lens to the vessels on the disk. A thin, veil-like structure extended between these bands, the center of which was freely movable in the center of the vitreous. It contained a blood-bearing artery and vein.

The vision was 5-4 in each eye, in spite of a hypermetropia of 1 D.

Concerning Keratitis Disciformis, with a Case. Dr. de Schweinitz reported the clinical history of a patient under his observation for nineteen years, during which period there had been numerous attacks of recurring erosion of the cornea preceded by vesicle formation, the original lesion having been caused by an injury to the cornea from the switch of a horse's tail. In the last of the attacks, which occurred during this period of years, the broken-down bleb spread into an area of superficial keratitis which stubbornly resisted treatment for a number of weeks, and then developed into the typical appearances of keratitis disciformis, by a formation of the disk-like body within the layers of the cornea, at first giving the impression of edema surrounded by a sharply marked border, differentiating it from the rest of the cornea and crossed with delicate lines protruding somewhat from its margin in the form of riders. With the contraction and healing of the corneal defect the disk-like body increased in density, and has remained a disk-like opacity in the center of the cornea in spite of all treatment, although after several months of massage, notably with a dionin ointment, the stippling is a little less dense than it was primarily, and the sharply marked border has somewhat faded, while the delicate striæ which conspicuously crossed its surface during the first forty-eight hours of its existence have entirely disappeared.

Dr. de Schweinitz, after reciting the history of this interesting disease, and referring to the American contributions on the same subject by Posey, and Veasey, showed how exactly similar had been the origin and development of his own case to those which had been observed by Otto Schirmer as the result of inoculation of the cornea with vaccine virus. Drawings of the disease at various stages of its progress still further emphasized the analogy between these two observations.

Traumatic Iridocyclitis and Localized Edema of the Macula.

Dr. de Schweinitz and Dr. C. M. Hosmer (by invitation) exhibited microscopic preparations from an eye removed on account of traumatic iridocyclitis resulting from a steel injury, and among other lesions demonstrated an advanced degeneration of the rods and cones and defect of the external nuclear layer, together with sharply localized edema of the macula. They compared their specimen with those which have been figured by Fuchs in traumatic iridocyclitis, in which he found cavities in the outer reticular layer, partly filled with coagulated fluid, which communicated with similar cavities in the nuclear layers, and which he regarded as due to an inflammatory edema. Similar observations of von Hippel in non-traumatic eyes were also described, and the opinion expressed, as these authors had already recorded it, that such lesions would account for the formation of the so-called "holes in the macula," which are well known after traumatism, and which have also been described a number of times in eyes entirely free from the suspicion of injury.

Meeting April 16, 1907. Dr. Howard F. Hansell, Chairman, presiding.

Drs. Wm. Campbell Posey and Frank C. Parker showed three cases: (1) *A Case of Bitemporal Hemianopsia in an Apparently Healthy Person*. The patient, a Hebrew salesman, aged twenty-six years, gave the history of a gradual diminution of sight in the left eye for three years past, and in the fellow-eye for two years. Glasses were worn one year before, but other than this no treatment had been administered. Several years previous to examination the patient had been in the habit of smoking from twenty-eight to thirty cigars per day, this number being reduced later to about ten to fifteen. Beer was used moderately. Specific history was denied. Other than the failing vision, dizziness at times was the only symptom complained of. The patient had ozena. The vision in the right eye was 6-12 and in the fellow-eye hand movements at $\frac{1}{2}$ meter. External examination showed a promptly acting pupil in the right eye, while that of the left was sluggish, although its consensual reaction was prompt. Internally the ophthalmoscope revealed a well-marked secondary optic atrophy in the left eye, with the right optic nerve similarly affected, though not to so great an extent.

The patient was referred to Dr. Spiller, who reported that there were no organic symptoms present. The field of vision in the right eye was limited to the nasal half, with contraction above and below for white, red and green. In the left eye the field showed a small area for white only, on the nasal side.

Treatment consisted of strychnine and potassium iodide in increasing doses, with a discontinuance of tobacco.

Four months after the first examination the vision in the right eye had improved to 6-7.5 and in the left to fingers at $\frac{1}{2}$ meter, with a slight enlargement of the visual fields.

(2) *A Case of Cerebral Syphilis, showing Old Left Optic Atrophy and Palsy of All the Ocular Muscles of the Left Eye Except the Inferior Rectus, with Choked Disk in the Right Eye.* A female, aged twenty years, presented herself with the following symptoms: Diplopia at twelve years of age, at which time the vision in the left eye was noticed to be failing, total blindness ensuing four years later. Dizziness, headache and uncertainty of gait, with periodic attacks of blindness during the past two years. O. D. V. 6-12, O. S. V. nil.

Externally, in the primary position, O. S. showed convergent strabismus of 45 degrees, with ptosis; the eye was also directed somewhat downward and inward. All outward and upward motion was absent. Left pupil 4 mm. and irresponsive, whilst in the right eye the pupil measured 3 mm. and acted promptly. There was no palpable tumor and proptosis was absent.

The ophthalmoscope revealed in the right eye a red, swollen nerve, with edges obscured and blurred, the veins being tortuous. The left eye presented a chalky-white disk. There was a paralysis of all the muscles of the left eye except the inferior rectus. The field of the right eye was concentrically contracted, especially on the temporal side.

Ung. hydrarg. in dram doses b. d. together with potass. iodid. were prescribed.

Dr. Spiller reported a drooping in the right lower facial distribution, with hyperesthesia of the left side of the face and poor station. Further symptoms were absent. The case was regarded as one of cerebral syphilis, the condition in the left eye being attributable to an old lesion, probably in the apex of the left orbit, while the present choking of the disk with the

involvement of the fifth and seventh nerves, together with the general symptoms, indicated a recent basal lesion, probably of a gummatous nature.

(3) *Palsy of the Right Inferior Rectus Muscle in an Hysterical Subject, with Grippe and Syphilis as Possible Causal Factors.* A woman, aged thirty years, came with a history of sudden diplopia three days previously, attended with dizzy spells, falling about the house, and unsteadiness of gait. She had been sick in bed for one week with a cold, and dated her trouble from that time. There was a history of one miscarriage, with four children living and three dead.

Ocular movements were good in all directions, except for a limitation in downward motion in O. D. O. D. V. = 6-6; O. S. V. = 6-6. The intraocular muscles were unaffected. When told to fix binocularly, the patient exhibited rather exaggerated symptoms of discomfort, giving the impression of an hysterical personality. Ophthalmoscopic examination was normal. The fields were normal, there being no reversal in outlines. Diplopia was obtained in lower field and to the right, pointing to palsy of the left superior oblique. There was no gross limitation of movement in either eye alone. Examination of the double images demonstrated palsy of the right inferior rectus muscle.

Examination by Dr. Spiller revealed no gross organic symptoms with the exception of the ocular palsy. The reflexes were generally increased and there was some tenderness in the inframammary regions and spine; there was also an exaggerated tendency to stagger. The case was viewed as one of hysteria, although it was thought that the ocular palsy had been caused either by grippe or syphilis.

Dr. George M. Gould read a paper entitled *The Refraction Changes Dependent upon Glycosuria*. He presented epitomes of the cases that have been reported, and added 2 unreported cases, 1 of Dr. Gould and 1 of Dr. Carpenter. He said that arranging the total 22 cases in three series we find the first composed of those in which myopia is increased by glycosuria (or decreased by its extinction) is made up of 6—those of Gould, Grimsdale, de Schweinitz's 2d, Appenzeller, Hirschberg, Du-jardin.

The second series, those in which hyperopia is decreased

by glycosuria (or increased by a return to normality) is made up of 8—those of Risley's 2, Carpenter, de Schweinitz's 1st, Neuberger's 2, Alexander and Groenouw.

The third series, those in which hyperopia is reported as increased by glycosuria, is composed of 8—Doyné, Horner, Cohn, Landolt, Gallus, Lichtenstein, Sourdille, Lundsgaard.

The principles governing the determination of the refraction condition were set forth, the chief requirements being the accurate or static refraction, before, during, and after the glycosuria. *Exclusion of reports* according to the foregoing principles becomes easier when we notice that there is no reported case of myopia in which glycosuria has not had the effect of increasing the myopia—that is, of bringing the focus of the dioptric system forward. All such cases are logical, one may say, as naturally the effect of glycosuria must be to affect the focus in that way. Whatever be the mechanism intermediating the change, it is impossible to comprehend how glycosuria can displace the focus posteriorly. Now, as the myopia of an eye is far more easily and accurately measured than the hyperopia, and without a cycloplegic, it is not surprising that all observers, good or bad, unite in their reports, that glycosuria, if it changes the refraction at all, increases the pre-existing myopia.

Confirming this result we find that the reports of eight cases of change in hyperopia also say that the effect of glycosuria is to advance the focus exactly as happens in myopia. And in this series occur the names of such trustworthy refractionists as Risley, Carpenter, de Schweinitz, etc.

It is simply inconceivable that the mere accident of the location of the retina in the path of the refracted cone of light rays should have the reverse effect in displacing the focus in hyperopia from what it does in myopia. Therefore when eight reporters find such an illogical if not impossible reversal of the natural consequences as testified to by fourteen, it behooves us to doubt the accuracy of the oculists' tests and reports rather than to indulge a belief in the inherently improbable and impossible. Dr. Gould reviewed critically the cases of those reporting increase of hyperopia, and came to the conclusion that there need be no compunctions in excluding, on the ground of erroneous diagnosis due to failure to estimate correctly the static refraction, almost all of the cases so far reported in

which it is claimed that glycosuria removes the focus of the dioptric system to a position posterior to that occupied in the previous non-glycosuric period.

As to the significance of the phenomenon, everybody has emphasized the importance of the recognition of the refraction and accommodation changes as warnings of the existence of the systemic disease. In the days of life-insurance examinations, of routine urinalyses by the general practitioner in almost all cases of ill-health, of the striking evidences to the patient of thirst, polyuria, etc., the warnings seem somewhat antiquarian, at least not of the first importance. The wideawake American oculist would prefer to doubly emphasize the overlooked truths:

(1) That the eye-strain preceding the glycosuric refraction change may have been a prime factor in producing the functional dietetic and nutritional disease called glycosuria; most significant is the fact that the great majority of the cases occur during the presbyopic period. (2) That the secondary refraction change serves as a perfect illustration of the increase of the diseases due to overstrain by the proverbial vicious circle, increasing the irritation and nutritional abnormalism by the secondarily induced refractive changes caused by the glycosuria. (3) The necessity of preventing quick-following ocular disease, both functional and organic, by heeding the accurate warnings given by the refraction changes consequent upon early and curable glycosuria. But whatever the point of view, and whatever the injuries done or threatened, the accurate diagnosis of the static refraction overtops and conditions every measure of prevention and every step of progress either in science or in therapeutics.

Dr. Walter L. Pyle referred to a study of the literature of this subject made by him some five years ago, and incorporated in a paper on "Ocular Affections Associated with Glycosuria," read before the Philadelphia County Medical Society. He was struck by the vagueness of opinions and lack of agreement as to the cause of sudden hyperopia in cases of glycosuria. According to Landolt it is due to change in the refractive index of the vitreous. Horner has suggested as a cause, dehydration of the vitreous body, with consequent decrease in the size of the eyeball. At a meeting of the Dutch Ophthalmic Society at Leyden in 1907, Van der Brugh called attention to the fact

that increase of the refractive index of the nucleus of the crystalline increases the total refraction of the eyeball, while increased index of the cortex decreases the total refraction, thus offering a plausible explanation of why the refractive change in glycosuric cases may be either hyperopic or myopic in nature. Personally, Dr. Pyle agreed with the essayist that, in most of the cases of hyperopia reported, there was a paresis of accommodation, allowing a hitherto latent hyperopia to become manifest. He had noted that sudden and pronounced failure of accommodation was often the earliest ocular symptom of glycosuric intoxication. On the other hand, Koster has suggested that irritation of the ciliary nerves and spastic contraction of the ciliary muscle may cause a spurious myopia in these cases. Dujardin has noted a most striking instance, possibly of this kind, in a diabetic woman of sixty-nine, whose vision suddenly changed until a pair of + S. 4.00 lenses was discarded for reading. As the pupils resisted strong solutions of atropin, it was believed that spasm of the ciliary muscle was the causative factor rather than a physicochemic change in the crystalline.

Dr. Randall said that the explanation of the phenomena was easy, vague only because multiform, even although it might seem a "blowing hot and cold with the same breath." We are all familiar with the increased refraction due to swelling of the lens in incipient cataract, which may antedate or even remain independent of any recognizable opacity; and the defective accommodation referred to is probably due to this rather than to any cycloplegia. On the other hand, reduction of the refraction would result from any increased index of the cortical layers of the lens, just as the nearly spherical lens of the infant is not excessively refracting for its short eye because nearly homogeneous. Increased refraction index of the vitreous would notably reduce the effect of the posterior curvature of the lens. So it is not necessary to assume error on the part of divergent observers nor to cite the manifesting in later life of the hypermetropia previously latent, as discussed in his paper, "Is there a Hypermetropia Acquisita?" (*Trans. Am. Ophth. Soc.*, 1899.)

Comparison of the curves of refraction and of sugar in the urine as done by Landolt may seem to miss the mark, since it may not accord with the percentage in the ocular humors; but

the matter is open to easy animal experimentation, as we can cause diabetes by puncture in the rabbit and other animals, and merely soaking a frog's foot in sugar solution will give him diabetic cataract. The ophthalmometer must be used to get its data as to the curves of cornea and lens and the changes in the focal planes in man and the lower animals; while the chemical study of the ocular humors will probably reveal the exact causation of the phenomena.

Dr. Gould said in closing that the remarkably sudden changes in the refractive condition, upon the disappearance of the glycosuria, which at times amounted to as much as 1 diopter in twenty-four hours, would seem to indicate that there was a change in the refraction index of the vitreous rather than in that of the lens. All the theories, however, were very uncertain, because of the vagueness in the reports of the facts. If these were better collected and the static refraction more carefully determined, it might be possible to find more satisfactory explanation for the phenomena.

Dr. William G. Spiller read a paper upon *Paralysis of Upward Associated Ocular Movements (Blicklähmung)*. This form of paralysis of associated ocular movement was discussed in connection with reported cases and a number of hitherto unrecorded cases. One of the cases was with necropsy, and the findings support the author's conclusions expressed in his previous paper, viz., that persistent paralysis of upward associated ocular movements is caused by a lesion near the oculomotor nuclei. The patient, a man aged forty-eight years (September 22, 1904), had paralysis of upward associated ocular movement with loss of convergence. Downward movement was possible, but was difficult. Lateral associated movements at this time were preserved. He had been very alcoholic. The speech was bulbar in character, and swallowing had become difficult. The saliva dribbled from the mouth. Ataxia of station was present. Headache was severe at one period. By December 28, 1904, associated lateral and downward movements had become much affected. On January 22, 1905, examination showed that mentality was poor, speech was more indistinct, deglutition was difficult, associated upward movements were lost, and all other associated ocular movements were much impaired. The associated lateral movements were

more impaired than the lateral movements of each eyeball separately. The upper limbs were slightly ataxic. Gait was fair, but frequently when the patient attempted to sit down he would lose his balance and fall backward.

A minute tumor was found in the cerebral peduncles. Its lowest portion was seen where the fibers of the oculomotor nerves leave the nuclei in large bundles. It was in the right cerebral peduncle, and extended toward the aqueduct almost as far as the lowest part of the oculomotor nucleus, and some of the fibers of the right oculomotor nerve passed through it. As sections more anterior were examined, the tumor was seen to extend farther dorsally, until at a part where the oculomotor nuclei had disappeared the tumor extended dorsally a little beyond the aqueduct of Sylvius. The tumor here had its greatest development and was 7 mm. from the aqueduct. Its greatest diameter in any section was barely 2 mm., and its greatest length dorsoventrally was 5 mm. It extended forward very nearly to the beginning of the third ventricle. It had the appearance of an alveolar sarcoma or endothelioma.

Dr. de Schweinitz congratulated Dr. Spiller upon the satisfactory manner in which he had collected the data in order to demonstrate that a persisting paralysis of associated upward or downward movement indicated a lesion in the vicinity of the oculomotor nucleus, or, as he supposed it might be put, quoting from other authors, of the quadrigeminal region. He referred to Mr. Swanzy's statement that in those cases of tumor of the quadrigeminal bodies themselves, in which there had been loss of power of the upward or of the downward motion of the two eyeballs, this should be regarded as a distinct symptom, and did not indicate that these bodies contained a center for the associated vertical movements, analogous to the center which almost certainly existed for the conjugate lateral motions in the sixth nerve nucleus.

The observation to which Dr. Spiller had referred, that in cases of deficient upward movement the eyeballs could usually be rotated farther if they were made to follow the uplifted finger than if the patients were simply told to move their eyes upward, was one which he could confirm from his own experience. In certain types of so-called hysterical muscular defects a somewhat similar condition of affairs was readily dem-

onstrable. Dr. de Schweinitz quoted one of his own cases of pronounced hysteria in which the patient cannot raise the eyes in the least above the horizontal level when directed to do so, although she is perfectly able, when her attention is directed momentarily away from the thought of upward rotation, to make this movement, or to make it when she is suddenly requested to look at an object above the horizontal meridian. The fact that these patients can move their eyes upward is also readily demonstrable with the aid of prisms.

Dr. Posey said that in addition to the case referred to by Dr. Spiller, as having been observed by him, he had seen two others, both the result of apoplexy. The notes of the first of these, which had already been reported to the Section, were those of a woman aged sixty-five in whom the apoplexy had in addition produced a right hemiplegia. The second case, which he had observed in the practice of Dr. Francine, was also a woman past middle life, who had suffered an apoplexy, but without the production of other motor or sensory phenomena. As in his two other cases, the pupils did not react to light or accommodation, and convergence was lost. The loss in upward motion was the same in each eye. All other associated movements were conserved.

Although the first case had been observed ten years before, there had been no recovery of the power to move the eyes upward.

Dr. Zentmayer said, as he understood it, Dr. Spiller's view was that in paralysis of the associated upward movements of the eyes the lesion is in or near the nuclei of the third nerve, and he believed that such a case as he had reported where in the recovery from such a condition the superior rectus on the one side had remained paralyzed for some days after recovery of the other muscles, substantiated this opinion. Snell has reported a similar case.

Dr. Gould referred to a patient who was able to turn either eye at will outward while fixing with the fellow, and was able to read test cards placed 90 degrees from each other, without altering the position of the diverging eyes. There was limitation also of the upward and downward movements and a slight deviation outward of one eye in ordinary fixation, for which operation had been proposed. He asked Dr. Spiller

if he knew of an explanation for such a condition.

Dr. Spiller in closing said that a case such as Dr. Gould described would have no connection with those which he had reported, as he had purposely excluded all congenital conditions. The only interpretation, if the isolated movement of the eyeball was active and not passive, would seem to be that the individual was extraordinarily developed, and must have a cortical center which controlled the movement of one eye outward independent of the other eye. Such a condition had never been demonstrated.

Dr. Zentmayer exhibited *A Case of Keratitis Disciformis* occurring in a young man seventeen years of age. Following a slight traumatism a small focus of infiltration spread to the diameter of 3 mm. and a shallow hypopyon formed. There was at present a round, disk-like opacity situated in the substantia propria of the cornea, scarcely visible by the unaided eye, but which by oblique illumination and the binocular loupe was resolved into pinpoint dots with a central area of about $\frac{1}{2}$ mm. diameter, of brownish color. From this point the dots radiated to the periphery, which was composed of a dense, whitish rim $\frac{1}{4}$ mm. broad, the outer margin of which was sharply defined from the surrounding clear corneal tissue. Dr. Zentmayer spoke of the differential diagnosis and stated that for the positive diagnosis of this condition the process should be followed from its incipency through the inflammatory stage of the formation of the cicatrix.

Dr. Zentmayer exhibited also a patient fifty-five years of age in whom an extensive *Epithelioma of the Lower Lid* had been entirely healed by the local application of chlorate of potash. The treatment had extended over a period of ten weeks. The powdered potash had been rubbed into the floor and edges of the ulcer at first daily and subsequently every other day.

Dr. Pyle said that he had used chlorate of potash for epithelioma of the face for a number of years, and reported two cases in which good results had been obtained by its use.

EDWARD A. SHUMWAY, *Clerk of Section.*

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of March 11, 1907. Dr. F. C. Hötzel, President.

Xanthoma Multiplex With Corneal Involvement.

Dr. F. A. Phillips presented a boy of eighteen with a large, yellowish, broadly sessile, slightly vascular tumor seated upon the upper third of the corneo-scleral limbus of the right eye. A similar growth affecting the fellow eye had disappeared and then reappeared. Typical lesions of xanthoma multiplex of some four years' duration were scattered over the body. Nine months before, the larynx had been attacked and a tracheotomy performed to relieve the obstruction. Although no part of the tumor of the eye had been removed for microscopical study, Dr. Phillips considered these lesions to be identical with those of the skin.

Dr. E. V. L. Brown suggested that the fatty nature of these tumors might make it possible to stain them black in situ by stripping back the conjunctiva and applying Flemming's solution.

A Case of Complete Albinism.

Dr. Willis O Nance exhibited a case of complete albinism in a girl of five years in whose family history, dating back to great grandparents on both paternal and maternal sides, no trace of a similar condition could be determined. The patient, born in Chicago, is one of five children, two of whom are dead; the parents and the two remaining children were exhibited before the society. They are of Irish descent, and all vigorous both physically and mentally. There is no history of intermarriage, admixture of negro blood, syphilis or other dyscrasia. The child's eyes are perfectly normal except for the complete absence of pigment. Nystagmus was present. The refraction is hypermetropic to the extent of 4 D. Dr. Nance agrees with Gould that the albinotic eye is not in any sense a diseased one, and that heredity or consanguinity figure little in its causation.

Dr. H. B. Young, Burlington, has seen three cases of albinism, one a child of five, the second a young lady of eighteen, and the third a woman about forty-five. As in Dr. Nance's case the eyes were normal throughout except for the absence of pigment. When the girl of five grew to young womanhood the albinism was much less noticeable.

In response to a question by Dr. Guilford, Dr. Nance said that the hearing of his patient was apparently normal, although a careful examination was not made.

Quinin Amblyopia.

Dr. H. W. Woodruff exhibited a patient who had been given 195 grains of quinin in four days some thirteen months ago. Total blindness of sudden onset lasted three or four days then vision returned, and in ten days he could see to get around. During the past months vision has continued to improve slightly and is now 20-60 and 20-40 respectively although there is a marked atrophy of each nerve-head and typical concentric narrowing of the fields.

Meeting of April 8, 1907. Dr. Henry Gradle, presiding.

A Case of Supernumerary Canaliculus.

Dr. Willis O. Nance reported a case of supernumerary canaliculus in a man of thirty, who complained of bilateral epiphora. There was present a mild chronic catarrhal conjunctivitis, but no history of dacryocystitis, or probing or of other treatment. Two distinct puncta were observed on the left lower eyelid, one in the normal position, the other on the direct marginal line about 4 mm. nearer the inner canthus. Probing and syringing demonstrated two separate and distinct canaliculi which led to the lacrimal sac or to a common duct very near the sac. The epiphora disappeared completely under appropriate treatment.

Dr. Nance found but twenty-two cases of supernumerary canaliculi recorded in the literature. The presence of the extra canaliculus has been said by some to be due to the development of two epithelial in-shoots, instead of one, from the primary duct.

Shrunk Sac After Enucleation.

Dr. Henry Gradle exhibited a man who had been unable to wear an artificial eye after enucleation of an eye wounded by a pistol shot years ago. The cul-de-sac was enlarged and Thiersch flaps engrafted; these did well, but shrunk considerably. He then put in a Krause flap without stitches, and packed the orbit with pellets of gauze. This procedure gave satisfactory results, although there was too much narrowness around the internal canthus which he remedied by Wolff

grafts, and the patient now wears an artificial eye with much comfort.

Traumatic Xerosis of the Cornea.

Dr. Henry Gradle. A man in perfect health, about 38 years old, was struck in the left eye by the elbow of a child four weeks ago. The severe pain had been relieved by hot fomentations. Ten days later Dr. Gradle found a sharply circumscribed punched-out defect on the corneal epithelium over which the smeared secretion of the meibomian glands collected as an oily scum; boracic acid solution would not moisten the abraded area in the least. No matter what treatment was employed, the effect was practically *nil*. Atropin was continued, dionin was used, and nitrate of silver was applied to the hypertrophied ocular conjunctiva with but temporary benefit. Salicylate of soda and subconjunctival injections were ineffectual. Two days ago Dr. Gradle scraped the abrasion, which gave the patient more comfort than he had before. The material removed showed the xerosis bacilli, epithelial cells, and some cells with granules that stained with methylene blue; it could not be determined whether or not these were plasma cells. The nasal corner of the abrasion is healing, but otherwise the lesion is unchanged. He curetted again this morning, and where he passed beyond the edge of the abrasion healing has taken place five hours after the operation. The floor of the abrasion looks the same as before.

Motais's Operation.

Dr. Oscar Dodd exhibited a patient and photographs taken before and after a comparatively satisfactory Motais operation for aggravated ptosis.

Corneal Tuberculosis Successfully Treated by Tuberculin With Opsonic Index Control.

Dr. Oscar Dodd exhibited this patient, a girl of fourteen. Six months ago there had appeared a marked episcleral swelling bordering the nasal half of the cornea, and infiltration and vascularization of the adjacent cornea. The condition was diagnosed as phlyctenular conjunctivitis, but got worse under the usual treatment; the conjunctival swelling then resolved under iodides and mercurials, but the corneal infiltration had increased to pin-head sized stroma nodules of yellowish white

color. The opsonic index for the tubercle bacillus was determined to be 8.91, 8.69 and 9.2 respectively, on three occasions in comparison with the normal of 10; a diagnostic injection of 5 mg. of old tuberculin gave a typical general, and very marked local reaction lasting several days and evidenced by the appearance of new and larger nodes, and the obscuration of the smaller ones by increased infiltration.

Examination of the lungs was negative, but during the height of the reaction from the tuberculin there were marked rales in the upper right apex, and marked inspiratory prolongation.

A month later (Feb. 8, '07), the opsonic index was 10.1; injection of $\frac{1}{2}$ c. c. of Koch's new tuberculin produced some local, but no general reaction. February 11th, the opsonic index was 9.3, and on the 13th, 11. On February 14th, she was given two-thirds c. c. of new tuberculin, and on the 16th, the opsonic index was 8.4. There was considerable local reaction. On February 18th, the index was 12.2. She was given $\frac{1}{2}$ c. c. of tuberculin, and on the 20th the index was 10.1; 11.6 on the 22nd. Another injection was given on the 22d, and one on the 25th, when the index went up to 15. Since that time it has varied from 12 to 15. The last injection was given March 22nd. The corneal infiltration has disappeared, the spots being almost invisible. The general health of the patient has improved very much. The eye is quiet, and the vision 6/6.

Conjunctival Tuberculosis.

Dr. Oscar Dodd. The conjunctival condition in this case closely resembled trachoma except in that the inflammation of the upper palpebral conjunctiva extended forward in front of the tarsus across the sulcus subtarsalis and to the very edge of the line formed by ducts of the Meibomian glands.

An Orbital Tumor of Ten Years' Standing—Endothelioma (Kroenlein Operation).

Dr. C. A. Leenheer. (*Entrance Thesis.*) Dr. Leenheer presented this patient, a woman of 34, with photographs taken at various periods during past ten years, before and after operation, along with microscopic specimens and three photomicrographs.

The patient gave a history of protrusion of the eye noted

ten years ago, at which time she refused to have the eye removed; the protrusion of the eye increased during subsequent three years, at which time the same advice was given and again refused. She came in September, 1904, at which time the Doctor found the following conditions:

Left eye blind and protruding $\frac{3}{4}$ of an inch; bulb well covered by the lids; divergent strabismus; vessels of the eye and lid engorged. The disk is best seen by a +4.

There is no palpable tumor in the orbit and a skiagraph shows no overgrowth of the bony structures. Transillumination of the frontal sinuses is negative. There is no history of syphilis and anti-syphilitic treatment proved of no avail.

March 15, 1905, a Kroenlein operation was performed by Dr. Schroeder. A tumor was found completely filling the muscle crater behind the bulb; the same had to be removed piecemeal; healing followed.

At the present time there is evidence of a return of the tumor.

Anatomical examination of the specimens by Prof. Zeit showed numerous firm, irregular tumor masses; one piece had taken the shape of the posterior portion of the muscle funnel and as such was studied in toto. The combined weight of the tumor was 8.53 grammes. Microscopic study showed *Lymph-Angio-Endothelioma-Perivascularis*.

Dr. Leenheer then gave an extended review of the Kroenlein operation and the literature of endothelioma, and closed with the following conclusions:

1. The pathologists differ very much as to classification of endotheliomata, but agree that endotheliomata are derived from the endothelial lymph spaces and blood vessels and that endotheliomata should be classed under sarcomata. They are of slow growth and do not form metastases.

2. The case reported in this article upholds this opinion.

3. In most of the cases reported as endotheliomata in the literature, the authors do not go into the microscopical findings. If all the orbital growths were examined microscopically, more endotheliomata would be found.

E. V. L. BROWN, *Secretary*.

ST. LOUIS MEDICAL SOCIETY:

THE OPHTHALMIC SECTION.

Meeting March 13, 1907. Dr. Carl Barck, Chairman, presiding.

Dr. John Green, Jr., presented a patient with "Sclerosing Keratitis." The sclera contiguous to the lower corneal limbus was slightly elevated and of a violaceous tint. The cornea adjacent was the seat of a crescentic greyish infiltration. Under sodium salicylate, gr. 15 ter die internally and local applications of heat, the corneal infiltration cleared below and the scleral swelling subsided. Recently the process had extended to the outer limbus.

Dr. Carl Barck presented two specimens of leukosarcoma of the chorioid. Recent writers have denied the existence of leukosarcomata, but the term should be retained, if only to indicate the macroscopic appearance of these tumors. The larger tumor was apparently intraocular, though there was a small black spot just outside the sclera, which was probably a metastasis. In the sclera itself were a couple of small islands, indicating invasion of this coat.

Dr. Meyer Wiener reported a case of steel imbedded in the sclera just above the entrance of the optic nerve. The point of entrance was 2 mm. above the upper corneo-scleral margin. He had divided the superior rectus and brought the large magnet in contact with the wound, but failed to extract the steel. He asked for suggestions as to the procedure next to be tried. In the discussion, Dr. J. Ellis Jennings said that an inflammatory exudate surrounding the foreign body might prevent its removal by the large magnet. He thought a small magnet might be more successful. Dr. A. Alt believed that if the large magnet had failed, the small would fail also. Dr. J. M. Ball recalled a case in which the foreign body was dislodged only at the eleventh application of the giant magnet. Dr. Barck believed that the division of the superior rectus was entirely unnecessary, as the foreign body could be approached through an incision to one side of this muscle. In some cases he had been successful with the small magnet after failure with the large.

Dr. J. Ellis Jennings reported a case of excavation of the

optic disk, of such unusual size as to closely approach the pathological.

The patient, a married man, aged 32, complained of headache and eye strain.

Refraction:

R 5/75+1.75 sph +0.50 cyl ax 105 V=5/5.

L 5/12+3.25 sph +0.75 cyl ax 120 V=5/6.

Tension and field of vision normal.

Ophthalmoscopic Examination. There was a very deep excavation of the nerve head of both eyes, more pronounced in the right. The excavation was complete except for a narrow edge of nerve tissue on the nasal side and above. This narrow strip was pierced above by the temporal and nasal arteries. All the other vessels save one, rounded over the edge of the cup and disappeared to view, reappearing again at the bottom in hazy outline, as in glaucoma. The important exception was the lower temporal vein which came directly forward from the center of the excavation, thus indicating in a positive manner that the excavation was not the result of pressure.

Dr. J. Ellis Jennings also reported a case of *congenital downward and outward displacement of the lens in a young woman, aged 19*. The refraction through the lens was -35.00 sph., and through the aphakic portion of the pupil 11.00 sph.

Vision with -30.00 sph. =15/70 in each eye.

Vision with +11.00 sph =15/20 4 letters in each eye.

Previously she had been wearing -20.00 sph., but now is wearing 11.00 sph. with great comfort and satisfaction.

Dr. J. C. Buckwalter alluded to a case of inward and upward dislocation of both lenses. It had been stated that individuals with congenital dislocation of the lens are frequently the offspring of consanguinous marriages. In the case referred to, consanguinity was denied. Dr. F. L. Henderson inquired why congenital dislocation downward was rare. It would seem that this form would be the most natural. Dr. Carl Barck stated that the explanation was a developmental one, depending on a delayed or faulty closure of the fetal cleft, which, together with the failure of the suspensory ligament at this point would cause the lens to be dislocated upward.

Dr. F. L. Henderson reported a case of *Thrombosis of the Cavernous Sinus*.

The patient, aged 29, was the unmarried daughter of a physician. She had been afflicted for a year with recurrent furuncles. May 8th, 1905, a small boil appeared on the right side of the nose. This was quickly followed by erysipelas around the right eye—proptosis, chemosis, and rise of temperature to 103 degrees. The temperature and pulse remained up throughout the attack, manifesting a tendency to sudden and radical fluctuations. The author was consulted May 12th. May 13th the orbit was incised deeply in three places but no pus was discovered. May 14th there was pain in the back of the neck on the right side. May 16th, definite swelling of neck back of right ear. May 17th, patient manifested apprehension and nervousness. May 19th, neck and face swollen. Patient in semi-stupor. Operation on cavernous sinus advised. May 21st delirious at night. May 22nd, began to spit up blood and pus. May 26th, pus began to discharge from small opening back of right ear. Mastoid operation done. Lateral sinus opened. May 29th, free discharge of pus from inner angle of orbit. Anti-streptococcus serum injected. May 30th, temperature 107. Death. The post-mortem revealed thrombosis of the cavernous-lateral and inferior petrosal sinuses and a clot in the jugular extending one-half its length. A probe introduced into the jugular foramen passed downward and forward, following a pus-channel directly into the naso-pharynx, thus explaining the dribbling of pus into the throat. The following are the interesting features presented by the case:

1. Life was prolonged much beyond the period averaged by other reported cases. This was probably due to the drainage established by the openings through the mastoid and pharynx.
2. Thrombosis of one cavernous sinus is usually followed quickly by thrombosis of its fellow, owing to the intimate connection through the circular and transverse sinuses. In this case the left cavernous was never involved, although all the basal sinuses of the right side were full of pus.
3. The edema of the lids and proptosis decreased after the first few days, although the gravity of the general condition gradually increased.
4. Twenty days after the beginning of the orbital cellulitis

pus voluntarily escaped from the orbit, though deep incisions and repeated probings had failed to release any before that time.

5. Though the basal sinuses were full of pus for days, it worked its way through the posterior pharyngeal wall instead of through the dura into the brain.

6. The presence of an abscess in the sclera, which the author believes to be a very rare phenomenon.

7. Twenty physicians were consulted during the progress of the case.

The author calls attention to the fact that suspicion of thrombosis of the cavernous sinus should be aroused when thorough incision of the orbit produces no pus.

In the discussion, Dr. A. Alt said that the eye was removed so long after death that it did not harden or stain well. There was a large abscess in the sclera near the optic nerve. Dr. Alt had never encountered a scleral abscess and believed it had not hitherto been described. Dr. J. W. Charles stated that the degree of exophthalmos depended on the preservation of the communication between the cavernous sinus and the ophthalmic vein. If this is occluded, the exophthalmos is greater. Dr. A. E. Ewing inquired whether enucleation would be of any value. Dr. Alt thought that enucleation could hardly be performed in time to prevent infection from the orbital tissues to the adjacent cavities.

Meeting of April 10, 1907. Dr. Barck, Chairman, presiding.

A Case of Perforating Injury of the Sclera. Dr. H. Meutze.

The patient, a carpenter, 37 years of age, was struck in the left eye by a No. 9 nail. There was a vertical scleral wound close to the limbus on the outer side with prolapse of the iris and a small quantity of vitreous. The anterior chamber was filled with blood and there was hemorrhage into the vitreous. The protruding iris and vitreous were abscised, and the wound sutured. Vision has risen from hand movements to 20/25.

A Case of Dyscoria Bilateralis. Dr. C. Loeb.

In both eyes the pupils are pear shaped, with the stem of the pear turned downward; in the right, it is nearly vertical; in the left, it makes an angle of about 45 degrees with the vertical meridian. There is no coloboma of the chorioid.

A Case of Persistent Pupillary Membrane (polycoria?). Dr. C. Loeb.

Parsons, in his work on pathology of the eye, objects to this term and asserts that "polycoria" should be used only in case of loss of substance occurring in the iris itself.

Persistence of the pupillary membrane is a developmental anomaly and is due to lack of absorption of the fetal membrane which covers the pupillary area.

It was first described by Adolph Weber in 1861. Possible arrangements are: 1. Several fibers arising at different points of the lesser circle stretch across the pupil and form a delicate network. 2. Fibers run tangentially between two points on the lesser circle. 3. All the toothed projections of the small circle are prolonged inward and project beyond the pupillary margin. 4. The fibers float free at their inner extremities. 5. Loops are formed by pairs of fibers in front of the pupil. 6. A network of fibers united in pupillary area into a membranous plaque. 7. Fibers are adherent at their inner extremities to lens with or without the formation of a plaque, or presence of exterior capsular cataract. 8. Fibers adherent to back of cornea. Not polycoria.

This case does not fall in any of the above categories as there are three distinct pupils, which dilate and contract similarly to the normal pupil.

A Case of Central Retinochorioiditis Associated with a Peculiar Exudate (?) into the Vitreous. Dr. J. F. Shoemaker.

The latter is best seen with plus five or six behind the mirror and has the appearance of an almost perfect circle. It is situated two disk diameters to the nasal side, and extends 4 or 5 disk diameters to the temporal side, so that this circular exudate surrounds the macular region. It is about the width of a retinal artery, and the same width practically throughout the entire circumference. Dr. Shoemaker was in doubt as to whether it was an exudate or a developmental anomaly.

In the discussion, Dr. Wiener stated that in view of the regularity of the caliber of the structure, and on account of the projection below, it might be a peculiar remnant of the hyaloid artery. He called attention to several little threads, especially to the nasal side, which resembled branches that had been absorbed. Dr. Barck regarded the case as unique, and agreed

with the former speaker that it was a congenital anomaly, probably an accumulation of condensed fibers in the vitreous, He was in doubt as to whether the condition in the macular region was to be regarded as a central regular chorioiditis, or a congenital coloboma.

A Method of Instilling Collyria. Dr. M. Wiener demonstrated his method of using an applicator wrapped with a small piece of cotton, for the purpose of instilling drops in the patient's eye. He considered it as easily managed as a dropper, and certainly cleaner.

Massage in Trachoma. Dr. M. Wiener.

In the opinion of the author, massage should always be from the fold of the lid towards the edge, and never back and forth, or from side to side. After a few moments rubbing, a sticky mucus secretion appears, and the follicles can be seen to empty rapidly.

Paper: *Papilloma of the Caruncle, with Report of a Case.* Dr. C. Loeb. (Published in full, page 226.)

JOHN GREEN, JR., M. D., *Secretary.*

BOOK REVIEWS.

Eye Injuries and Their Treatment.

A. MAITLAND RAMSAÏ, M. D., Glasgow. Published by James Maclehose & Sons, Glasgow, and The Macmillan Company, New York. \$6.)

This volume is based on the lectures delivered by the author to post-graduate classes. It is purely clinical, and deals but little with the discussion of theories. The author describes very clearly the manner in which he handles injuries of the eye, and, coming from one with such a vast clinical experience, many valuable points and suggestions are given. Naturally, the work will find favor more with the physician in general practice, away from specialism, than with the trained ophthalmologist, for whom it might perhaps be considered too elementary. The chapter on serpigenous ulcer of the cornea is particularly good and instructive. In the treatment of this disease, once so formidable and intractable, modern ophthalmology has, the author says, obtained one of its most brilliant successes. He draws the practical lesson that it is infection rather than traumatism that brings about serious injury to the cornea, and that proper precautions and early attention to all trivial injuries will prevent the occurrence of suppurative keratitis, but if inoculation has occurred, and ulceration is progressive, early and thorough application of the cautery is likely to cause its arrest.

Penetrating wounds of the eye with retention of a foreign body is the subject of another valuable chapter. The sideroscope, X-ray localization, and magnet extraction are very practically described. The advance made in this direction is expressed by the author when he says that before the introduction of the magnet and the Röntgen rays, there is not, so far as he is aware, a single instance on record of a foreign body having been removed from the vitreous chamber and the sight at the same time saved.

With regard to sympathetic ophthalmia, the author admits that its nature is still somewhat obscure, but accepts the results of recent investigations, which, he says, have shown that

"it is due to micro-organisms and their toxins traveling from the injured eye." Laboratory experience and clinical observations go to support the theory that infection is necessary before a wound of one eye can be the cause of inflammation in the other. Indeed, says R., if it were possible to avoid sepsis, sympathetic ophthalmia would be altogether prevented. No need is found to identify a specific micro-organism as the exciting cause of sympathetic inflammation, for any of the infective organisms found in wounds may produce it.

In the chapter on *Ocular Therapeutics*, the newer remedies are discussed, as well as, very briefly, serum therapy, sub-conjunctival injections, the application of heat and cold, blood-letting, counter-irritation, etc. One procedure is advocated which, we think, will not appeal much to American surgeons. The author says that when inflammation is due to syphilis, the presence of an open sore, in his experience, is most helpful, and in such instances he has not the slightest hesitation in inserting a seton in the nape and keeping it there for several months.

The concluding chapter describes the routine method of preparing for and conducting operations in the Glasgow Ophthalmic Institution, following which is the complete formulary of the institution.

The book is beautifully printed, and contains twenty-five very handsome full-page plates, some in black and white, and some in colors.

Although considerably padded, as many English books are, and appearing to contain much more material than it does, it is, nevertheless, a great satisfaction and pleasure to read from a book in which no expense has been spared to supply the best paper, printing and workmanship, and in which the true art of bookmaking has not been lost for the sake of a cheap production.

WM. T. SHOEMAKER, M. D.

A Treatise on the Motor Apparatus of the Eyes Embracing an Exposition of the Anomalies of the Ocular Adjustments and Their Treatment.

GEORGE T. STEVENS, M. D., Ph. D. (Published by the F. A. Davis Company, Philadelphia, 1906. Price \$4.)

The author has given in this book of about five hundred pages a most scholarly description of the anatomy, physiology

and anomalous conditions of the motor apparatus of the eyes. The illustrations are numerous and so selected as to aid greatly in the proper understanding of the text. It is distinctly a work for advanced ophthalmologists—for those with sufficient knowledge and experience to enable them to read with profit, and to understand also that in this particular field the true interpretation of many of the ocular muscle phenomena must still remain a matter of opinion.

Some years ago the author wrote a book on "Functional Nervous Diseases," in which the central doctrine was, that *"difficulties of adjustment of the eyes are a source of nervous trouble, and more frequently than other conditions constitute a neuropathic tendency."* He is, after thirty years' experience, fully convinced of the truth of this proposition, and offers the present work as a sequel to the previous one, with the hope that a practical acquaintance with the principles and practice contained therein will promote the more systematic development of the above doctrine. The doctrine as stated above is doubtless correct, but its various interpretations and adaptations have also been productive of harm.

The energetic ophthalmologist, like the gynecologist, for a time had an absolutely certain (?) method of curing not only neuroses, but organic nervous disease. He had, however, twelve muscles to cut instead of but two ovaries to remove. As rational and certain in their results as both procedures seemed to their advocates to be, nevertheless fewer muscles are cut today and fewer ovaries removed. The pendulum swings, and will continue to swing.

The author considers the subject under four headings—Anatomy, Physiology, Anomalous Conditions of the Motor Muscles of the Eye Consistent with the Physiological State, and Anomalous Conditions of the Motor Apparatus of the Eyes Not Consistent with the Physiological State. Under Anatomy, nothing new is added. Under Physiology, accepted doctrines are given, and many new suggestions are introduced. In the last two sections, the author's experience and originality are predominant. As a contribution to the subject, Dr. Stevens's work is the most far-reaching and valuable which we have, and adds much to the advancement of American Ophthalmology.

WM. T. SHOEMAKER, M. D.

A Manual of the Diagnosis and Treatment of the Diseases of the Eye.

EDWARD JACKSON, A. M., M. D., Denver, Colo. (Second Edition, published by W. B. Saunders Company, Philadelphia and London.)

The second edition of this well known manual has been thoroughly revised and brought to date by the inclusion of the newer facts (not fancies) pertaining to every branch of the subject, which have accumulated since the publication of the first edition in 1900.

The author accomplishes his objects as set forth in the preface, and has produced a book which will meet the needs of the beginner in ophthalmology and the general practitioner of medicine. For the latter, who finds it necessary or advisable to know *something* of ocular diseases and conditions, for the protection of himself as well as his patient, and to acquire that knowledge readily and quickly, it will be particularly useful. Lengthy discussions of theories and possibilities are omitted, and accepted views and known facts are detailed in the clear-cut, concise and forceful manner so characteristic of the author.

In this connection the author says that an especial effort has been made to avoid being carried away by those temporary enthusiasms which become so noticeable in medical literature from time to time, only to disappear completely a little later. No one is better qualified than Dr. Jackson to accept from the prodigious amount of literature being manufactured at the present time, the very small percentage contributory to the science, and to reject the very high percentage contributory mostly to the authors. Dr. Jackson has, therefore, been particularly fortunate in following this idea in his Manual.

A selected bibliography designed "to open a path for the student into the broader literature of ophthalmology," is placed at the end of the volume.

WM. T. SHOEMAKER, M. D.

NEWS AND NOTES.

XAVIER GALEZOWSKI died in Paris March 22, 1907, aged 75 years. Galezowski was of Polish birth, but spent most of his life in Paris, becoming at the close of the Franco-Prussian war a naturalized French citizen.

HUGO MAGNUS died in Breslau, April 13, 1907, aged 65 years. In 1883 he became Extraordinary Professor of Ophthalmology at Breslau, having served for the ten preceding years as Privatdocent. Although contributing extensively to other lines of ophthalmology, he was especially interested in color sensation, and the history of ophthalmology.

His *Augenärztliche Unterrichtstafeln* are familiar to all who have visited the eye clinics abroad and elsewhere, and are most useful and instructive charts to live with in our clinic work.

The next annual meeting of the Ohio State Medical Society will be held at Cedar Point, Ohio, August, 1907.

The following program has been arranged for the Section on Ophthalmology:

Cornical Infections—T. F. Bliss, M. D., Springfield, Ohio.

The Treatment of Purulent Ophthalmia—H. B. Harris, M. D., Dayton, Ohio.

A Review of the Oculist's Records for Ten Years at the Ohio Institution for the Blind—J. E. Brown, M. D., Columbus, Ohio.

A Method of Extracting the Capsule Left After the Absorption of Traumatic and Other Cataracts—D. W. Greene, M. D., Dayton, Ohio.

Obstructions of the Lacrimal Canal, Their Pathology and Treatment—W. L. Carrol, M. D., Youngstown, Ohio.

Tri-chlor-acetic Acid in the Treatment of Diseases of the Nose, Throat, Eye and Ear—E. H. Porter, M. D., Tiffin, Ohio.

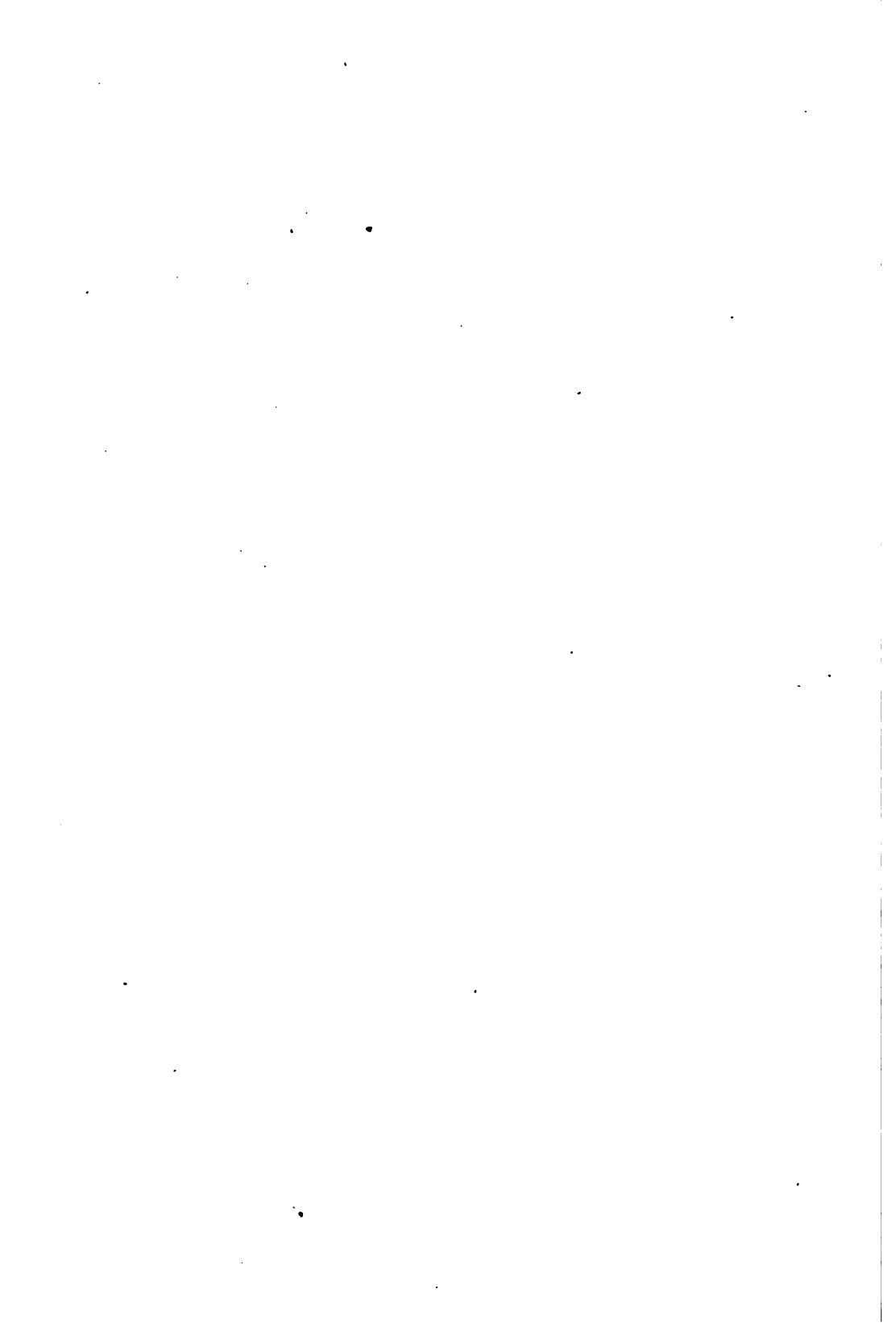
Anisometropia—William E. Bruner, M. D., Cleveland, Ohio.

Refraction, What to Prescribe after Static Findings—J. E. Cogan, M. D., Cleveland, Ohio.

Reports of Cases and New Instruments Shown.

Social Session (Evening).

The Interdependence of Diseases of the Eye, Ear, Nose and Throat—John E. Weeks, M. D., New York City.





William Thomson, M. D.

THE ANNALS OF OPHTHALMOLOGY.

Vol. XVI.

JULY, 1907

No. 3

BIOGRAPHIC SKETCH OF WILLIAM THOMSON, M. D.

By HOWARD F. HANSELL, M. D.

PROFESSOR OF OPHTHALMOLOGY IN THE JEFFERSON MEDICAL
COLLEGE, PHILADELPHIA.

In 1879, the writer, a graduate in medicine of that year and an assistant in the Eye Dispensary of the Jefferson College Hospital, was invited by Dr. Thomson, then Honorary Professor of Ophthalmology in the College, to take care of his practice during the summer. From that accident began a friendship, protective and generous on the one part, devoted and receptive on the other, that has continued without interruption until a few weeks ago. Dr. Thomson's death occurred on August 3rd. He had been in his usual good health, enjoying his work and pursuing his many occupations until ten days previously. After a day of unusual exertion, traveling to Atlantic City and return, and attending to his interests in Philadelphia as well, he became acutely ill with uremic poisoning. The illness was hopeless from the first and despite every effort of his attending physician, Dr. S. S. Cohen, and the unremitting attendance of his son, Dr. A. G. Thomson, and other members of his family, the end could only be postponed a few days.

Dr. William Thomson, Professor Emeritus of Ophthalmology in the Jefferson Medical College of Philadelphia, was born January 28, 1833, in Chambersburg, Pa., where he spent his boyhood and received his early education. His father was the Hon Alexander Thomson, Judge Sixteenth District of

Pennsylvania; and his mother, Jane Graham Thomson. His family, conspicuous in the past one hundred years in the history of the growth and development of Pennsylvania, has been given additional lustre by the long professional career of its illustrious medical member. The history of Philadelphia would be incomplete without distinguished mention of one of the pioneers and leaders in ophthalmic medicine, just as the history of the Pennsylvania Railroad would be incomplete unless it included the personal history of his brother, the late Frank Thomson. After graduation from the Jefferson College in 1855, he commenced general practice in Lower Merion, Pa., and two years later married Rebecca, daughter of William E. George, of Merion, who, together with two daughters and four sons, survives.

From 1861 to 1868, Dr. Thomson, at great personal sacrifice, gave his time, his abilities, his skill, his experience and his knowledge of men, in short he gave all he had, to his country. At the outbreak of the Civil war he entered the ranks of the defenders of the Union as a member of the medical staff of the regular army, and during the following four years, when men's courage and physical endurance were sorely tried, took an active and heroic part on several battle fields. Notwithstanding the many duties of the army surgeon in those days of war and bloodshed, his ability as executive officer, and his fertility in originating methods for the better treatment and management of large numbers of sick and wounded, led to his rapid promotion to the grade of Assistant to the Medical Director of the Army of the Potomac, and later to the supervision of all the army hospitals in Washington. During his service, these hospitals contained over 23,000 beds and in 1864 alone provided for 11,300 disabled men. He was on duty with the Army of the Potomac before Bull Run. He joined General McClellan's headquarters at Harrison's Landing, continued throughout the Antietam campaign and down to Fredericksburg when he was ordered to take charge of the Douglas General Hospital, Washington. After the battle of South Mountain he was left in charge of over 3,000 Union and Confederate wounded. In 1861 he introduced the use of creosote in the treatment of wounds and undoubtedly saved many lives, and many limbs from amputation. Later he demonstrated the value of bromine in the treatment of hospital gangrene at the

Douglas Hospital. During the last years of his service in the army he paid particular attention to the study of photography and microphotography in their application to medicine, thus adding materially to the value of the reports of surgical cases under his care in the hospitals. After his resignation from the army in 1868, he entered into the practice of ophthalmology in Philadelphia, the impetus to this special line of work having been given by his studies in photography.

His public charitable work in his specialty began in 1868 as Assistant Surgeon to Wills Hospital, a hospital devoted exclusively to the medical and surgical treatment of diseases of the eye. Four years later he became one of the surgeons and performed with thoroughness and brilliancy the duties of that position until his resignation, in 1877.

In 1873 Dr. Thomson was elected Lecturer on Diseases of the Eye and Ear in the Jefferson College, and in 1880 advanced to the grade of Honorary Professor of Ophthalmology. In these two positions he worked laboriously to instil into the minds of the hundreds of students who listened to his lectures the essential truths of ophthalmology, the supreme importance of the diagnosis and correction of optical errors, and the causative relation of ocular abnormalities to many reflex and remote symptoms. His path was not strewn with roses. Ophthalmology as a special branch of medicine was not recognized by the laity and by the profession in general, and by his own colleagues in particular, his efforts to secure for it the professional standing to which he considered it entitled, were at first scarcely appreciated, if not actually frowned upon, for ophthalmic surgery was considered but a branch of general surgery and in no wise entitled to special favors. But his persistence and able advocacy won for his beloved branch the public recognition he craved, and in the achievement of this result the school and the profession everywhere owe him a debt of gratitude.

Dr. Thomson was the first, in 1873, to establish a daily clinic for the treatment of diseases of the eye as distinct from the other clinics in the Jefferson Hospital. To the development of this clinic he gave personal and almost daily attention. His assistants during his twenty-two years of service have cause to remember him with affection. By his enthusiasm in the work, by his kindness and generosity, they felt that they were

not merely assistants in the clinic but were his personal friends. He allowed no opportunity to escape that could give to each man the facilities of the clinic for the purposes of learning and teaching. His training in the treatment of disease and the correction of optical defects was invaluable and everyone who has gone into practice from his service in the Hospital under Dr. Thomson's tuition, has felt through the years that followed the numerous advantages that have accrued from contact with so great a teacher. Unselfishness in distributing the credit and honors of the dispensary service was a distinguishing characteristic, for, instead of appropriating these good things for himself, he distributed them impartially among those who were fortunate enough to serve under him. He was genial and sympathetic with younger men and won their lasting regard and respect.

After serving the College faithfully for four years he was made Ophthalmic Surgeon to the Hospital in 1877. While performing practically the same work, his election to this position meant increased honor to himself, and was a recognition on the part of the Trustees of the School, not only of ophthalmology as a special branch of medical science, but of its importance in the College curriculum. The opportunities for the study of the specialties at that epoch in the history of the Jefferson College, or other American Colleges, were few, yet, such as they were, they were utilized to the fullest by Prof. Thomson. He was always willing and anxious to extend to every student interested in his subject the opportunity for further clinical study than the weekly lectures afforded, and many availed themselves of this privilege. During the twenty-two years that the teaching of ophthalmology was entrusted to his care, hundreds of graduates have gone away with more than a superficial knowledge of the subject, and some with a deep enthusiasm that afterwards resulted in making ophthalmology their life's study. The advanced and recognized standing that his beloved subject has had accorded to it throughout the world is in a large measure due to his devotion to it. So important was its teaching deemed that the Trustees of the college in 1895 made Dr. Thomson full Professor with a seat in the faculty. After holding this office for two years he resigned, whereupon the Trustees conferred upon him the title of Emeritus Professor.

Dr. Thomson's contributions to the literature of ophthalmology, and to that concerning the relation of ophthalmology to general medicine, have been numerous and valuable. The most conspicuous papers are those on "Diseases of and Injuries to the Eye" in Prof. Gross's System of Surgery; the ophthalmologic section in the first publication of the Annual of the Medical Sciences; the article on "Surgery of the Eye," in the American Text Book on Surgery; the article on "Normal Color Perception and the Detection of Color Blindness," in the American System of Diseases of the Eye; The appendix to Nettleship's English work on Diseases of the Eye, on "Color Blindness and its Detection." His contributions to the ophthalmoscopic diagnosis of intracranial affections and of general disease have been of great value. One of the very early workers in refractive problems, he most forcefully and constantly impressed upon the profession the necessity of accurately diagnosing and correcting any refractive error as a preliminary to the thorough understanding and treatment of almost all disorders of ocular function. A generation ago, he was the first to preach, to practice and to insist upon the wisdom of correcting optical defects as fully as possible, and then urging that the patient wear his glasses for both near and far, especially in the case of young myopes. He was also among the first to call attention to headaches caused by eye-strain and that the greatest service oculists can render to humanity is both to recognize that headaches and other reflex symptoms are caused by accommodative and muscular strain, and to relieve them by the proper corrections and operations. To give a man the full use of his eyes he considered better than to give him clearness of sight, and acting upon this principal he has restored many persons to useful lives. To the surgical therapeutics of eye disease he devoted much attention and attained consummate skill, both in determining the necessity for operation, and in the operative procedures themselves. In cleanliness and antisepsis, and in dexterity in handling the delicate instruments, he had no superior. Dr. Thomson is widely known for his work in the detection of ocular defects in railroad employes, and his system of examination for color blindness has been adopted for protection from accidents, of the public and employes on most of the large roads of the country.

Dr. Thomson's intellectual pleasures were not limited to the pursuit of his chosen specialty but included studies in all branches of medicine and allied subjects. He has been a member of the local and general ophthalmologic societies, of the College of Physicians of Philadelphia, American Medical Association (delegate from the Medical Staff, United States Army, 1863), Pathological Society, Academy of Natural Sciences, Philosophical Society, Neurologic Society (honorary) of New York, International Ophthalmologic Society, Vice-President, Ophthalmologic Section of the International Medical Congress in 1876, etc., etc.

The charming personality of Dr. Thomson gave him a popularity accorded to few. Of average height, symmetrical figure, exceedingly handsome and intellectual face, scrupulously neat in his personal appearance, in spite of his modesty and unassuming manner, his friends were proud to be reckoned as such, and strangers who sought what was best in men were anxious to meet him. Up until the last he retained the qualities that had given him such prominence in his profession and in society, and to those among us who have known and loved him for a generation, his death is an irreparable loss.

THE AMPLITUDE OF ACCOMMODATION AT DIFFERENT PERIODS OF LIFE AND ITS RELATION TO EYESTRAIN.

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This subject is not brought forward as one that is wholly new, but as one upon which more extended study may give us new ideas of practical importance. From the time that Donders named his great treatise, *The Accommodation and Refraction of the Eye*, down to last year when Treacher Collins urged the intimate connection between the development of the power of accommodation and the general state of the ocular refraction, the importance of the dynamic factor in refraction has been appreciated by every thoughtful scientific student of the subject.

It was with surprise that I read Dr. George M. Gould's recent statement: "Many of our puzzling non-successes are due to failure to recognize insufficient or parietic accommodation, or premature presbyopia. The books do not know of it, and the lecturers do not speak of it." From my first taking up of ophthalmic practice, it has been a part of my routine examination to measure the amplitude of accommodation. I doubt if I have ever prescribed a pair of glasses to a private patient under 55 years of age without doing this; and even in dispensary cases this routine has usually been followed.

Our notions of "eyestrain" are chiefly concerned with strain of accommodation, and strain in maintaining binocular fusion; and it must be admitted that our ideas connected with strain of accommodation are far better developed, and more definite, than those concerned with the strain to overcome imbalance of the extra-ocular muscles. Astigmatism and hyperopia attain their enormous practical importance through the strain of accommodation that they entail. To ignore the dynamic factor in refraction was impossible. To assume that it was constant, or that it was an easily calculable function of a patient's age, could only be done by closing our eyes to many obvious or easily

ascertainable facts. Still, constantly as our attention has been given to this subject, much remains to be learned before we can claim a full mastery of it.

Imperfect Methods of Measuring Accommodation.

Our clinical methods of determining the near point of distinct vision, and through it the range of accommodation, fall far short in accuracy of our methods for ascertaining the acuteness of distant vision. Most of the series of reading test-types that have been in common use, like Snellen's, have no letters so small that they cannot be read at 20 inches or farther by persons with normal vision. Such types constitute a very inferior test of the accuracy of focussing at a distance of 3 or 4 inches, especially with the pupil strongly contracted with convergence. They give us uncertain information regarding the near-point and amplitude of accommodation in young persons and myopes.

For a good many years I have used chiefly a test composed of the ordinary letters, reduced by photography so that the smallest types are just read at 10 inches with normal vision; and occasionally I have used still finer photographic reproductions, only visible within 3 or 4 inches. It would be a real boon if some of the inventive ingenuity now devoted to devising special forms of knives, forceps, or phorometers, were applied to this problem of producing tests for the accurate determination of the near point of distinct vision.

As matters now stand, we are compelled to rely upon the patient's understanding of what it is we wish him to observe, and upon the patient's judgment as to when blurring of the test-type begins. Some time is consumed in teaching each patient how blurring of the print occurs when it is brought too close to the eye, and that he must make the maximum effort to keep it as clear as possible, and then to make an accurate observation as to where this gradual alteration begins.

Statistics.

In view of the imperfection of our methods, and the inexactness and uncertainty of the data obtainable in the individual case, it is worth while to call to our aid statistics, in which the influence of individual errors, and the personal equation, will be reduced to a minimum. As the basis for this present study of the subject, I have had the amplitude of accommodation

calculated for 3346 cases seen in private practice, in which the accommodation was measured as a preliminary to the prescribing of lenses. The averages of results in diopters for each five years of the patient's age are given in Table I. The maximum accommodation met with for each period, the average and the minimum are shown in the last three columns of the table.

TABLE I.

Age	Patients	Average A.	Minimum	Maximum
5 to 10	87	12.28	16.	8.
10 to 15	242	10.66	15.	4.
15 to 20	406	9.50	16.	3.25
20 to 25	456	8.70	12.	3.50
25 to 30	429	7.86	12.	2.50
30 to 35	410	6.78	10.50	2.
35 to 40	344	5.70	8.50	2.50
40 to 45	349	4.38	8.	1.25
45 to 50	303	2.38	6.75	0.
50 to 55	209	1.40	4.50	0.
55 to 60	70	.80	3.	0.
60 to 70	41	.16	1.50	0.

Accommodation in Early Childhood.

The statistics of accommodation for the early years of childhood are very scanty. Even the school statistics of Risley, which include the determination of the near point, give little help in deciding the general amplitude of accommodation in the lower grades. And it is generally agreed that the answers of young children are of such unequal and uncertain significance that it is as well in school examinations not to attempt systematic examination of the lowest grades. Great uncertainty, therefore, exists as to when accommodation attains its maximum and begins to decline.

It is easy to assume that accommodation is at its maximum at birth, or in very early infancy, and progressively diminishes from then on. I think it is rather common to take this assumption and to act upon it. I am sure that statements based upon it are to be found in literature, and that I have made such statements myself. But it now seems to me that this assumption is not correct.

Both analogy and direct observation rather indicate that the accommodation in early infancy is undeveloped and feeble, that it gradually increases for a time, remains but little changed for some years, and then begins its gradual decline. The power of accommodation is rather imperfectly developed in the lower

animals, generally not approaching in extent that possessed by man. Being thus of late development in the race, it would naturally be of late development in the individual. It is of value for the exact appreciation of small objects. This is only possible after the acquirement of high acuteness of vision; and full visual acuity is not developed in early infancy. The infant deals rather with large masses and general effects. The ciliary muscle though fairly developed at birth, has by no means attained its maximum bulk, and its relation to the crystalline lens is not then such as to give it a maximum influence over the form of the lens. Probably with the ciliary muscle as with other muscles, maximum power comes only with development under use.

To learn the real lesson of my statistics with regard to the development of the power of accommodation, I have prepared a table giving the average range of accommodation encountered each year between the ages of 5 and 15 years.

TABLE II.

Age	Patients	Average A.	Maximum	Minimum
5	2	12.75	13.50	12.
6	5	11.55	12.25	9.75
7	15	12.46	15.50	9.75
8	23	12.77	16.	7.50
9	38	11.71	16.50	8.50
10	39	11.49	15.	8.
11	53	10.61	14.	4.
12	42	11.18	15.	6.
13	53	10.62	14.	7.
14	52	9.79	14.	6.
15	67	9.57	14.50	5.

In this table each year is taken separately, and on account of the smaller number of cases the averages are more irregular than those shown for the five periods in Table I. But the general trend of the testimony thus presented is unmistakable. There is no general diminution of accommodation until the eighth year, and the fall is not decided until after the twelfth year.

I cannot leave this subject without a few words with regard to its practical bearings. Hyperopia is recognized as causing convergent squint, through the excessive accommodative effort due to the attempt to see clearly small near objects, when the accommodative power is yet imperfectly developed. Probably many of us have seen convergent squint arise during the temporary impairment of accommodation by post-diphtheritic

paralysis, or after other exhausting disease. It may similarly arise from accommodation that is weak because undeveloped. There seems to be a good reason for the popular impression that a child whose eyes incline to cross, should be kept from looking at small objects close to the eye; and there is good ground for the treatment of beginning convergent squint by the efficient use of a cycloplegic *in both eyes*. The fact that often at the beginning of school life accommodative power is still not fully developed, should also have weight in determining the age at which a child should begin school work, and the kind and constancy of the work required of him during the early years of school life.

Strong Accommodation Conceals Hyperopia.

Turning again to Table No. 1, it will be noted that the average amplitude of accommodation for the different eyes does not vary greatly from the averages given by the older writers, except perhaps for the years of childhood to which allusion has already been made.

In early life the cases which show unusually strong accommodation are of interest chiefly from the bearing of this on diagnosis. A patient with 16 D. of accommodation might have 3 or 4 D. of hyperopia, and yet his near point would be quite as close as would be expected. So that, if the hyperopia were largely latent, its amount and importance might pass unsuspected. In the earlier years of refraction work, following the teaching of the older writers, I relied considerably upon the near point to give some indication of the amount of hyperopia that might be latent in young patients. While the near point does give some indication, it is too indefinite and too often misleading to be relied upon. If the indication furnished by the position of the near point is contradicted by other evidence, no importance should be attached to it.

Accommodation Deficient.

The cases in which the accommodation falls sufficiently below the normal average for the patient's age to make the deficiency of practical importance, are frequent enough to justify their consideration at some length. But I must here pass it with comparatively brief mention. At the outset of special practice, nearly 25 years ago, I encountered the case of a healthy boy of 15 who had only 5 D. accommodation; and required 1.75 D. added to the correction of his hyperopic

astigmatism, in order to do his work at school. Recently I have seen a boy of the same age who had but 3 D. of accommodation. Both of these patients had been subjected to the influence of atropin for several weeks in the hope of revealing hyperopia that was supposed to be latent, and they each had a long history of unrelieved eyestrain.

But besides these cases in which the range of accommodation is manifestly deficient, there is another class not shown by the above tables, in which the near point appears to be about where the average accommodation for the patient's age would place it; yet in which there is marked insufficiency of the patient's accommodation for the requirements made of it. This class cannot be better illustrated than by quoting a case which I reported 20 years ago. (Trans. Pennsylvania State Medical Society, 1886.)

W. G., a young man of 19, of good general health, but a hard student, during the winter of 1884 had increasing headache and failure of accommodative power and endurance. By the beginning of February these had rendered study almost impossible. Under homatropin the refraction of both eyes was proven practically emmetropic (less than 0.25 D. hyperopic astigmatism in either). I gave him instructions as to how to use his eyes for study with the least possible demand upon accommodative power, and ordered for near work for each eye 1 D. spherical, with a 2° prism, base toward the nose; that the accommodation might be assisted without interfering with the relation between accommodation and convergence. The use of the homatropin necessitated two days' suspension of school work. After that he went right along doing the work under which he had just broken down. Improvement commenced at once, and progressed steadily, until, a month later, he was entirely free from headache or asthenopic symptoms. He continued his work without other inconvenience up to the end of the school year; and then, with lessened demand upon the power of accommodation, was able to throw aside the glasses altogether.

The Period of Presbyopia.

As we come to the age when presbyopia is usually expected, the amplitude of accommodation has a determining influence on the time at which the glasses must be put on or modified

for near work. In no place is harm more likely to be done by substituting averages for the facts of the individual case than just here. The tables showing an average accommodation at the different ages, although properly intended to illustrate the subject, have done positive harm in the hands of incompetents, especially the rule-of-thumb opticians. This harm has happily been limited by the objections which some patients have to making any statement regarding their age, and the known unreliability of the statements that are made by others.

Many patients under forty have fully arrived at the age of presbyopia, and eyestrain dependent upon it; while some emmetropes and hyperopes pass the age of fifty without any real need of lenses for presbyopia. There is nothing really incongruous or astounding in this latter fact, and yet I remember feeling a good deal surprised when I first encountered a patient over fifty who had full distant vision and had never used glasses or felt the need of them. This patient was a literary man, using his eyes most of the time for near work, and was a little hyperopic, yet he had enough accommodation for all his needs.

A little later in life an unusually high amplitude of accommodation has important effects that are readily ascribed to other causes and left unrelieved. I have seen a man aged 52 who had 1.5 D. of hyperopia latent; and apparently no accommodation, until the use of a cycloplegic revealed the true state of his refraction. Many times have I encountered patients over fifty, who had never been under prolonged observation by fairly competent oculists, in whom the possibility of latent hyperopia as a cause of the symptoms seemed not to have been suspected. I have studied such a patient with the view of unmasking his hyperopia, only to find at the next test that his hyperopia was considerably higher than I suspected at the first visit, and often to find it at a subsequent test still higher. The statement which I made fourteen years ago, with regard to the latency of hyperopia deserves still to be emphasized; "That it is not more frequent or proportionately greater in childhood or in early adult than in middle life." I believe now that latent hyperopia is more frequent and more troublesome after forty than before that age. Hyperopia of low degree is more apt to be latent after fifty, and at that age is very often the cause of eyestrain of obscure origin.

The age at which accommodation ceases or becomes inappreciable is seen to vary widely. In one case it had entirely disappeared at the age of forty-six; in the majority of cases it was present or reduced to 0.25 D. after sixty; but in one case there remained 1.50 D. at the age of sixty-eight years, which would seem to indicate that it may persist to the age of seventy-five or eighty.

In taking the near point of old people, it is necessary to guard against two important sources of error. The smallness of the pupil may enable the patient to read quite fine print without having the eye optically adjusted to focus accurately for the distance at which it is read. Or the refraction may vary in different parts of the pupil, so that good distant vision may be obtained through peripheral parts of the pupil, while the central part of the pupil (or the whole of its area when the pupil is contracted with strong convergence, may be decidedly myopic. The former may be guarded against by noting that the pupil is large, or even by dilating it with cocain. The latter may be excluded by skiascopic examination. In the more remarkable cases which I have met with, I am sure that these sources of error have been excluded.

It is clear that it is not unusual for the accommodation to persist to a considerably greater age than we have been accustomed to suppose. And I know of no reason why patients with healthy eyes who still possess accommodation of practical importance should not be allowed to use it. They generally appreciate the increased region of distinct vision which the weaker lenses afford them.

Sex Difference in Accommodation.

Another point which is of some interest, brought out by this study, and which was a surprise to me, was the difference in accommodative power between the two sexes. Perhaps none of us would be surprised that women giving their ages between thirty and fifty should show less accommodation than men between the same ages. I have tried to guard against this by excluding from my tables a great many women between these ages in whom the statement of age was decidedly open to suspicion. I also tested my tables by comparison with the accommodative power of a smaller series of women whose ages were positively known to me; and I think the differences shown in Table III really exist.

TABLE III.

Age	Male	Female
5 to 10	12.44	12.13
10 to 15	10.87	10.58
15 to 20	9.91	9.32
20 to 25	8.89	8.85
25 to 30	8.	7.80
30 to 35	6.87	6.73
35 to 40	5.89	5.62
40 to 45	4.49	4.30
45 to 50	2.89	2.78
50 to 55	1.53	1.48
55 to 60	0.90	0.83
Over 60	0.65	0.50

The surprising thing is that these differences were found to exist from early childhood until the final decline of accommodation.

Inequality of Accommodation in the Two Eyes.

The frequency of inequality of accommodative power in the two eyes is not brought out by these tables. A moderate inequality, 1 D. or less, is not rare. But in persons who have accommodation of 5 D. or over, this difference is of little practical importance. With the advent of presbyopia, moderate differences between the accommodative power of the two eyes more frequently need to be considered in the relief of eyestrain. Of course, the difference between the strengths of the two lenses given for presbyopia will not equal the differences between the accommodative powers of the two eyes. Commonly the difference between the lenses will be the same proportion of the difference of accommodative power, as the proportion of accommodation habitually to be used for near work; or rather less than this. Commonly the difference between the lenses will be from one-third to two-thirds the difference of accommodation, or in young persons even less than one-third. Higher differences of accommodative power are clearly due to unilateral or unequal pareses of the ciliary muscle, which are almost always accompanied by similar pareses of the sphincter of the pupil. But the low degrees exist without inequality of the pupils.

SUMMARY.—In presenting this study of the amplitude of accommodation, let me especially call your attention to:

The wide range of variation in persons of the same age and with apparently healthy eyes, making the near point a poor indication of the amount of hyperopia latent.

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The frequency and importance of subnormal accommodation, even in childhood.

The variability of the age at which presbyopia begins.

The frequency of hyperopia latent after fifty.

The practical importance of differences in accommodative power between the two eyes.

And in general, the urgent necessity for studying carefully the amplitude of accommodation in every case of eyestrain.

1434 Glenarm St.

PRELIMINARY REPORT OF TWO CASES BELIEVED
TO BE INTRAOCULAR TUBERCULOSIS. CASE
NO. 1. TUMOR OF CHORIOID. PROBABLY CON-
GLOMERATE TUBERCLE. CASE NO. 2 RELAPS-
ING PLASTIC CHORIOIDITIS, PROBABLY TUBER-
CULAR.

COLMAN W. CUTLER, M. D.
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CASE 1. C. A., male. Seventeen years old. At school. Family history negative to tuberculosis.

Previous history. When eight years old, measles. During convalescence, symptoms of peritonitis, thought to be due to appendicitis, which was not the case. Abdomen opened, peritoneal cavity found to be filled with a large quantity of clear viscid lymph, but appendix was normal and was not disturbed. Peritoneum was thickened and succulent, but not congested as in peritonitis of septic origin. Operation by Dr. Robert T. Morris. Patient recovered from peritoneal conditions and soon afterwards is said to have developed pericarditis, pleuritis and meningitis. Following summer, had malaria. Since then an occasional bilious attack.

Habits—Smokes three pipes a day. No alcohol. Appetite good. Bowels regular as rule. Patient out of doors a good deal. Venereal, no history obtained.

Present history. No history of trouble with eyes until present illness, November 24th, 1906. On this day, shortly after kicking football, (patient states positively he neither suffered blow nor made any very violent exertion) he noticed a blur before right eye, obscuring the upper half of objects. Neither pain nor irritability of eye. This blur remained unchanged. November 28, four days later, ocular examination: Neither eye shows any external signs of disease. Pupils equal. Tension normal. Media clear.

Right eye. A large tumor-like mass is seen downwards involving the lower half of the fundus, from a distance two

*Read before the American Ophthalmological Society, Washington, May, 1907.

nerve diameters below the papilla as far as can be seen toward the periphery. The upper part of this mass, for from three to four nerve diameters rises gradually two to four diopters; the lower part then rises rather abruptly to an elevation of eight to ten diopters. The surface is fairly smooth. The color is that of the normal fundus without any nodular appearance. The mass is immobile. At its upper margin, there is considerable grayish, edema-like striation of the retina, reaching nearly to the macular region. Over the greater part of the tumor, there is a branching network of dark and light spaces, apparently sub-retinal, suggesting, in some degree, the tapetum of the chorioid. No signs of active chorioidal disease, no new vessels and no connective tissue can be seen over any part of the tumor nor in the extreme periphery of the fundus. The optic nerve is hyperemic, the veins somewhat enlarged and tortuous. Würdemann's transilluminator showed diminished translucency over the site of the tumor. Vision 20-200. Left eye normal; vision 20-20+.

Treatment.—Rest in bed; limited fluids; eye bandaged; pilocarpin gr. 1-5 hypodermically daily for five days was followed by profuse perspiration.

Physical examination: Dr. N. B. Potter. December 1st; well developed and nourished. Rather pale. Left apex—slight retraction—diminished expansion—slight dullness; prolonged expiration; otherwise normal; urine normal.

December 15th; It was apparent that the vision had improved and the field had become larger, although the recumbent position prevented an accurate examination. All signs of retinal edema had disappeared and the tumor seemed more sharply defined. Exploratory puncture of the sclera was performed at the point of greatest elevation of the tumor; no fluid escaped and the ophthalmoscopic appearance of mass was unchanged.

January 8th; Tb. O. I., 1.35. January 14th, 2 mg Koch's T. R. No constitutional reaction. Temperature depressed one degree. January 15th; Tb. O. I., 1.45. January 18th, nerve somewhat more hyperemic, swollen one to two diopters. Small gray patch previously noticed above the nerve has resolved into three discrete flecks, and slightly below the level of the nerve, along the course of the inferior nasal vein, and posterior to the level of the vessels are eight small gray dots.

January 20th; Tb. O. I. 1.02. Spots previously noted are unchanged. The dots downwards and inwards have become much more numerous, some of them being slightly confluent. Further to the nasal side, along the margin of the tumor, are a few small clear striations such as might be caused by stretching or thinning of the retina or superficial chorioid. January 21st, group of dots to nasal side of nerve are more fuzzy and larger, but not more numerous. January 24th, this group has almost faded, while, during the past few days, a new collection has appeared a little above and further to the nasal side, of the same character. These begin as small discrete dots of a clear white, gradually becoming larger and less sharply defined, fusing with those nearest, and, in the course of two or three days, fading away entirely, so that on January 26th, the first group have entirely gone, the second have become much fainter, and with irregular splotches, almost like albuminous exudations.

January 31st; 5 mg Koch's T. R.; O. I., 1.13. February 1st, O. I., 1.00, A. M., O. I., 0.9, P. M. Apparently a negative phase. Marked constitutional reaction with a rise of temperature to 101.6—a total of nearly 3°. Condition of eye same as at last note, except spots were even less sharp and no new ones seen. February 2nd, Tb. O. I., 0.8. Nerve a little redder, grayish edema of nerve fibers. One rather larger white dot remains, others have disappeared. February 4th, Tb. O. I., 1.25. Constitutional reaction over. Greatest elevation of tumor apparently ten to eleven diopters. February 6th, elevation nine diopters. February 7th, nerve less turgid and edge of tumor more sharply defined. A few more faint dots were seen with strong illumination (electric ophthalmoscope), single large one downward is brighter. It seemed as if they had reappeared with diminution of swelling. Small inoculations beginning with 1-10000 mg for therapeutic purposes were increased gradually to 4-10000 in eight days. Vision +1 Cyl. axis 90 equals 20-40, minus.

February 14, Tb. O. I. 1.45. Inoculation 0.0004 T. R. February 15th, Tb. O. I. 1.02. Changes since last note trifling until to-day, when a new group of spots were noted in the same general locality. The Opsonic Index followed fairly closely the changes in the clinical signs. With brightest light, many old spots can still be seen deeply, although invisible to

ordinary illumination. February 19th, O. I., 0.71. T. R. 0.0008. February 21st, Tb. O. I. 0.85. Inoculation T. R. 0.0016. After this rapid increase of dosage and low Opsonic Index, the evolution of the group of dots noted on February 18th progressed until February 22nd. Those that appeared first became less pronounced, while newer ones made their appearance. No constitutional disturbances. February 23rd; O. I., 1.05; Tuberculin inoculation withheld because of marked local reaction in eye. Those appearing on 18th having, in part, disappeared, those noted on 22nd being less clear. The nerve which was hyperemic and somewhat swollen on 20th has become normal. Vision 20-30.

March 3rd; Tb. O. I., 1.05; March 5th; the groups of dots have continued to diminish in numbers and distinctness. In the periphery, to the nasal side, at the margin of the flatter part of the tumor, seen best with plus two diopters, is noted an irregular slate-colored area with whitish striae near it, and below it, and toward the nerve, is a faint reticulation not previously seen. These appearances remained practically constant, becoming perhaps a little more marked, and being apparently independent of the fluctuation of the crops of dots which seemed to coincide with the lowered Opsonic Index, and which followed with some regularity the larger doses of tuberculin. March 7th, O. I. 0.87; March 18th, appearance of tumor the same; very few dots seen, and they are almost invisible, with brightest illumination; grayish striation well marked.

In order to bring the retinal or chorioidal changes still more definitely into association with the inoculations, an interval of nearly a month had been allowed to elapse since the last inoculation on Feb. 21, during which time there was a gradual and uninterrupted subsidence of the fluctuating ophthalmoscopic picture.

March 19th; Inoculation 0.002 mg T. R., O. I. 0.9. March 21st; O. I., 1.13; March 23; Inoculation 0.003 mg T. R.; March 25th; faint reappearance of dots began on 20th, increasing slightly during following days until to-day. Seem brighter, but on the whole, much less marked than after large injections February 18th and 21st, as if patient were acquiring some tolerance.

Radiographic report, Dr. Lewis Gregory Cole.

PLATE 4576.

Region—chest posterior.

Position—back flat on plate.

Distance of tube from plate 50 c.m.

Exposure 15 seconds.

Both lungs equally aerated.

Heart shows distinctly.

Walls of bronchi show distinctly.

Apexes apparently do not appear to be affected.

There is a very marked thickening around the root of the lungs, particularly the right side. In the region of the descending bronchus, there are several isolated tubercles.

PLATE 4577.

Region—chest anterior.

Position—abdomen flat on plate.

Distance of tube from plate 50 c.m.

Exposure 15 seconds.

Shows thickening around root of right lung even more distinctly, and on this plate, though the involvement of the parenchyma is very slight, I believe we are justified in making a diagnosis of tuberculosis.

After Dr. Potter's visit to Saranac, it was decided to employ Bouillion Filtrate instead of T. R. Therefore, the small doses were returned to and increased rather rapidly. April 2nd, spots were not easily seen, but whole region to nasal side of the disk and below the horizontal line is a little blurred as though by sub-retinal or chorioidal edema. April 4th, appearance of edema is less. One large spot seen faintly, below the macula, grayish in color. April 9th; the reaction in eye had been so slight that a more rapid increase of dosage was attempted. April 11th, during the last few days, a new crop of fine dots has appeared in original neighborhood, more numerous than for some time past. April 19th, the last profuse crop has gradually faded without any exacerbation during the past week.

May 4th, the inoculations were continued; a few fresh dots were seen, increasing for four days.

About twenty inoculations given, small, with the exception of the first ones, which were given to produce a constitutional reaction. These small doses will be continued avoiding local as well as general excitation.

There can be little doubt that this patient had tuberculosis. The reaction to tuberculin, the physical signs and the X-ray picture are enough to base a fairly positive diagnosis upon.

The intraocular tumor can only be a leuco-sarcoma, or a conglomerate tubercle, and the latter diagnosis seems probable

because of the appearance of the small white dots in repeated crops after the tuberculin inoculation. These dots are small at first, becoming larger and softer in outline daily, and vary in size from $\frac{1}{4}$ to nearly twice the calibre of a vessel of the first order. They were never seen in front of the vessels, in fact. the impression received was that of considerable depth, as if they became less distinct, or their appearance was delayed by the edema noted as following the use of tuberculin, and reappeared three or four days after the inoculation, when the swelling had diminished. At times, it seemed as if the action of the inoculation was cumulative—as if the response was not due to single large doses. It is natural to assume that this cycle constitutes a local reaction. It would be rash to theorize regarding the nature of these flecks. It is known that miliary tubercles may appear and disappear in a very brief time, but if these are tubercles, or tubercular dust of Barthoz and Rilliet (Collins) why should some of them not have remained or grown larger after the inoculations were stopped? It is more reasonable to suppose that they represent some peculiarly localized form of exudation following the inoculation. The fact that the eye showed no general reaction, no ciliary injection, or photophobia, and that the vitreous was always clear, might indicate that the bacilli were not numerous in spite of the size of the tumor.

The tumor may well have existed for a long time without attracting attention until the sudden appearance of the blur, which would indicate increase of edema or detachment of the retina around the mass and nearer the macula, impairing central vision, which disappeared with the preliminary treatment. Since that time, vision and field have remained practically unchanged, and the mass of the tumor has not increased in size, although certain unexplained structural changes have become apparent near its margin, not exactly like those described by Haab in his classic case of conglomerate tubercle, but possibly of similar origin. The stationary character is contrary to the rule of tubercle of the eye, and might be attributed to the influence of tuberculin.

The field of vision has increased for form, less for color, but does not correspond to the area of the tumor, showing that perception and form of white objects is retained over a considerable part of it, while large colored objects are seen

less well. It is not possible to predict the outcome, but the patient will be kept under observation and it is hoped that a later report may throw more light on the nature of the tumor and the response to treatment.

CASE II. J. G. Male. Aged 26. Clerk.

Family history: Father died of pulmonary hemorrhage. One sister died several months ago from nephritis and some lung trouble. Did not live with sister. Habits good. No venereal history. Work indoors. Digestion poor. Nervous.

Previous history: In 1901, patient had an attack of plastic chorioiditis, which I reported in a paper read before the Ophthalmic Section, New York Academy of Medicine. This attack began suddenly. In the left eye, the ophthalmoscopic examination showed in the vitreous, a veil of exudation with shreds or filaments stretching forward from the nerve; over the upper and inner half of the nerve, was a large white exudation covering, in part, the vessels; outlines of nerve hazy. Vessels not notably large or tortuous. To the nasal side of the nerve, and above it, are two patches, the upper pinkish with edges bordered by a thin deposit of pigment. A retinal vessel passes over it. Below this, a bright white area slightly raised, with surrounding edema. Vision 20-50 unimproved. The right eye was normal.

Under treatment with tonics and potassium iodide, the condition improved rapidly, and in six weeks, vision was normal. Vitreous clear, except for filmy opacities from the exudate overlying the optic nerve. One and a half years later, vision was still normal. The ophthalmoscope showed irregular pigmentation, and partially atrophic areas corresponding to the former exudation. There were branching prolongations of connective tissue over the vessels on the nerve extending a little into the vitreous. No signs of activity. There was no suspicion at that time of any constitutional condition except possibly syphilis. But, as the ocular condition improved with comparatively small doses of iodide and coincidental with the improvement in his general health, this diagnosis was not considered probable.

Present history: January 29th, 1907. Patient re-appeared with the following history: Two weeks ago he coughed up five or six mouthfuls of blood. At about the same time he noticed that the vision of the left eye was blurred as six years

ago. Three days ago, had another hemoptysis, several drams, the blood being bright and frothy. Vision has been growing steadily worse. No cough, no sputum, no fever, no sweats, no cardiac or renal symptoms.

Examination by Dr. Potter: Patient fairly nourished—not anemic. Heart normal. Lungs—right, normal; left, slightly diminished expansion, and impaired percussion note over apex anterior and posterior. Anteriorly, just below the clavicle, inspiration is a little harsh and there were a few fine subcrepitant rales and a little increase in whispered voice. Weight 134 pounds.

Ocular examination—Vision, right eye, 20-15; left eye, 20-40 unimproved. Vitreous, many opacities large and fine; nerve edges blurred to one nerve diameter beyond; outwards and downwards edges fairly sharp. Upwards and inwards, beyond the exudation on the nerve, about one and one half nerve diameters, is a large white area with blurred, soft edges, below this two nerve diameters is a small area, apparently less active, and between these, several characteristic spots of disseminated chorioiditis. Between these is a faint irregular area with ser-piginous edge, showing indistinctly an erosion of superficial layer of chorioid, or deep retina, with a very few indistinct pale spots at the edge. Cornea, iris, aqueous, and lens, normal. Eye not irritable. Tension normal.

February 4th, in French Hospital. Temperature, pulse and respiration normal. No further hemoptysis. Tb. O. I., 1.56. February 10th, Tb. O. I., 1.00. General condition improving. No change in pulmonary signs. February 14, Tb. O. I., 1.34. No rales heard. February 15th, the exudation in vitreous increased. That on the nerve became more prominent. Still confined to the upper and inner quadrant. Vision in left eye 15-200.

February 17th, 1-20,000 mg. Koch's old Tb. General condition continues to improve. February 17th, vitreous the same; nerve covered with exudate, white; swollen one to two diopters; the clear white mass upwards and inwards is more sharply defined toward the nerve, but seems to be extending somewhat with the soft edge outward; the other condition unchanged. February 19th, 1-10,000 mg. Koch's old Tb. O. I. to Tb. 0.93. February 20th, O. I. to Tb. 1.07. February 21st. O. I. to Tb. 1.05 1-5000 Koch's old Tb. February 23rd, nerve

somewhat clearer, vitreous haze more dense, large spot has a light areola beyond it as if of an extension outwards, corresponding to the scotoma. Otherwise, same. Vision 20-70. February 25th, 1-2500 mg. Koch's old Tb. General condition same. Eye condition appears worse. Vision 20-70 minus. Vitreous haze denser with several new filaments in front of nerve and below it, the large spot is broader and more blurred at the edge, upwards especially. Exudate on the nerve a little less pronounced.

March 1st, condition of eye the same. March 4th, O. I., 1.06; vitreous much clearer, otherwise the same. Vision 20-40. March 7th, O. I. to Tb. 0.7, vitreous a little less clear, nerve looked less sharp; large patch out and up is more edematous but no larger. This activity is undoubtedly responsible for the vitreous opacities, but it is possible that the exudate on the nerve is also active. Vision 20-40. March 9th, vision 20-30 minus. Advance of exudate has ceased. Vitreous clearer. March 13th, continued improvement, exudate on nerve is much thinner, and only up and in does it extend beyond the nerve edge. There are two small areas on the nerve, brighter or whiter than the rest and apparently slightly elevated. March 14th, had a small hemoptysis yesterday and slight epistaxis this A. M. Pulmonary signs same. No rales. Sent home to keep absolutely quiet. Given Calcium-lactate, gr. x, t. i. d. ad six doses. March 15th, no further hemoptysis. March 20th, has been perfectly quiet—no further hemoptysis. Temperature normal; O. I. 1.68. March 21st; in spite of the slight hemorrhage a week ago, he thinks his eye has improved. Vision 20-30. March 26th, Bouillion Filtrate, .0000001. March 28th, condition continued to improve steadily, vision 20-20. The white patch is much grayer, showing faintly granular edge and partial atrophy of the chorioid, which is seen to extend far towards the periphery in a narrow and irregular patch. The atrophy is not deep, the floor being granular; pigmentation is not black, but grayish or slate-colored. The other areas have remained practically unchanged. The small whitish areas on the nerve stand out in greater relief. Vision 20-20.

Radiographic report. Dr. Lewis Gregory Cole.

PLATE 4580.

Region—chest posterior.

Back flat on plate.

Distance of tube from plate—22 in.

Exposure—15 seconds.

Shows a well marked infiltration of the left apex with a few scattered tubercles throughout the entire left lung. There are a few isolated ones apparent in the apex. As seen in all these cases of early infiltration of the parenchyma, we have a very well marked thickening of the roots of the lungs. Whether this is due to the thickening of the walls of the bronchi, or to deposits in the bronchial glands, I am unable to say definitely, but probably, it is the latter.

PLATE 4581.

Region—chest anterior.

Position—abdomen on plate.

Distance of tube from plate 50 c.m.

Exposure—15 seconds.

The infiltration appears very much more marked in the anterior plate, showing that the lesion is more in front than behind.

March 30th, B. F. .0000002; April 2nd, B. F. .0000002;
April 4th, B. F. .0000005; April 6th, B. F. .0000006; April
11th, B. F. .000001; April 16th, .000002; April 20th, B. F.
.000003; April 23rd, .000004.

In this case, plastic chorioiditis recurred after six years in a strikingly similar manner. With the second attack, there were unmistakable signs of pulmonary tuberculosis. The exudate on the nerve head was so marked that there seemed to be an actual involvement of it at the upper margin, especially, which disappeared as the inflammation became less active. The vitreous contained many large opacities—no deposits on Descemet's membrane.

This patient undoubtedly has tuberculosis, as shown by the physical signs, the history and the X-ray plates. Because of the active chorioiditis, it was not thought wise to give a large dose of tuberculin to produce a constitutional reaction. Tuberculosis, as a factor of the ocular condition, was not suspected in 1901, and the rapid recovery made it necessary to group it in the large and ill-defined class of plastic chorioiditis. The recurrence of the ocular condition in an almost identical manner, coincidental with the development of an acute pulmonary lesion, makes it probable that the present attack is tubercular, especially as it has recovered with no other treatment than rest and repeated inoculations of small doses of

tuberculin. The condition was advancing somewhat rapidly. The chorioidal exudate was increasing during the first period of observation without any treatment, until on Feb. 15th, vision was 15-100. After that date, the changes correspond, as will be seen by the notes, to some extent, to the use of tuberculin. On February 26th, there was a slight increase of exudation, which would perhaps indicate that the tuberculin had been increased too rapidly, provoking a greater activity. This was followed, however, by a gradual improvement of the eye, which has continued with slight fluctuations, which may or may not have been due to the treatment, until a relatively normal condition was reached. Vision is 20-20. The pulmonary condition was not so favorably influenced.

About eighteen doses have been given.

ANISOMETROPIA.

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We all meet frequently with cases of anisometropia, and realize that some of them are difficult to handle. I do not come with anything new pertaining to this condition, but wish to make a plea for more frequent and greater effort in the care of these patients to preserve or to increase the usefulness of the more defective eye.

The term anisometropia strictly includes all cases in which there is a difference in the refraction of the two eyes. Landolt says, "Anisometropia exists whenever the two eyes demand, in order that each shall possess its maximum of visual acuteness, or in order to present to the observer the same clearness in their ophthalmoscopic images, two different numbers of spectacle glasses." We apply it here, however, only to those cases in which there is a *decided* difference in the refraction of the two eyes, either in kind or in amount. Some writers distinguish between anisometropia and antimetropia, using the former where the kind or type of error is the same, and the latter where one eye is hyperopic with or without astigmatism, and the other myopic with or without astigmatism. We include both types under the title of this paper. Various combinations of this condition may exist—one eye may be emmetropic and the other have a considerable error of refraction of any kind; both eyes may have the same type of refractive error but of unequal degree; or they may represent the true cases of antimetropia.

The condition is usually congenital, though there are certain acquired types as in aphakia, after removal of the lens from one eye. An incipient or developing cataract by reason of the changes which take place in the lens from swelling with resultant myopia may produce anisometropia more or less variable in amount. A corneal scar or macula will frequently produce an high astigmatism, and may lead later to the development of myopia in that eye. Conical cornea frequently leads

to anisometropia. Numerous cases might be given to illustrate the various acquired forms of this condition, for in many of these patients both eyes may be successfully corrected with benefit and comfort to the patient. I purpose confining this paper, however, almost exclusively to the congenital form, nor have I included that rather large group of cases of antimetropia in which each eye has only a slight error of refraction, as they present nothing of unusual interest or importance and accept the proper lens for each eye, without any difficulty, and with marked relief of symptoms. Occasionally, however, we find patients who have difficulty wearing glasses which correct only a small amount of anisometropia, much more difficulty in fact than the average patient who has a marked difference between the two eyes. I have also largely omitted those cases in which the error is so great in one eye, as for example a very high myopia, that any attempt to correct it is out of the question; and also those cases in which the highly refractive eye is so amblyopic that a glass for it is entirely useless, or if I have corrected it, the patient still continues to use one eye as before, and the result would have no bearing upon the general subject under consideration. I have also omitted a large number of patients from whom I have obtained no report as to the result of the treatment.

Not infrequently in these cases we find some asymmetry between the two orbits or even between the two sides of the head. Donders endeavored to ascertain some relation between the two conditions but did not succeed. "I can only in general maintain," he says, "that at the side where the strongest refraction, or rather the longest visual axis, occurs, the orbit (and with it the eye) is situated closer to the median line, while its surrounding edges are placed more forward." "There is," he thinks, "a connection between the two, but that the connection is not absolute is not strange, for just as with differing form and position of the orbits the two eyes may be emmetropic, it must be possible that equality of the eyes should exist with difference of the orbits of the same individual." There is frequently supposed to exist some relation between inequality of the pupils and inequality of the refraction of the two eyes. Frenkel (*Annales d'oculistique*, October, 1906) after a study of five years including 5,000 cases, found only ten cases in which anisocoria and anisometropia were as-

sociated. Of these, six had the larger pupil on the side of the greater ametropia, and four on that of the lesser. The larger pupil corresponded to the higher refraction (i. e., more myopic or less hyperopic) in five cases. He concludes that, "Nothing justifies the assertion that certain cases of pupillary inequality depend upon an inequality of the refraction; nor that the larger pupil corresponds most often to the side of the greater ametropia; nor that it corresponds, with any greater frequency, to the side of greater refraction, and finally, there is no scientific reason for admitting any sort of relation between anisocoria and anisometropia."

These cases of anisometropia may be arranged into 3 groups:

1. Where one eye only, and always the same one, is used, and the other is permanently excluded, whether the vision of the other eye may or may not be improved with a glass,

2. Where good vision may be obtained in either eye, and the patient may be able to use either eye separately, but binocular vision is lacking,

3. Where binocular vision can be obtained.

In the first group are found many of the neglected cases of anisometropia, cases for which something could have been done in childhood, but when we see them later in life there is a marked amblyopia of the one eye, the patient is getting along comfortably with the use of the other eye, and is unwilling to give the time and trouble to train the defective one, even if assured that eventually he might obtain useful vision with that eye. In many of these cases, however, training would accomplish little or nothing, and even if by long training some improved vision might be obtained, binocular vision would still be lacking and never could be attained. If the case is seen in early childhood, much can sometimes be done for it. If the child's eyes are such that even the good eye is in need of a glass, or it is evident that he will need help for that eye before he gets much older or progresses far in school, the sooner we correct his eyes the better; and we should then correct the more defective eye as near the full as possible and at once start exercising it, if the vision is defective, and as the vision improves also institute training of the fusion sense as in a case of strabismus. This condition of anisometropia will be found in not a few cases of strabismus, and this same line of

treatment will be important for the correction of the strabismus as well as the improvement of the defective vision. In three patients in the subjoined table belonging to this group (cases 28, 44 and 75) no effort was made to correct the anisometropia. They were in middle life (ages respectively 48, 43 and 47), had been perfectly comfortable using one eye, or had already found that any attempt to make the two eyes work together caused them annoyance or discomfort, and instead had only the one eye corrected. Such lenses were given and afforded them perfect comfort.

The second group includes those patients who may see with either eye alone, but do not obtain binocular vision. Even in the absence of binocular vision, not a few of these patients prefer to have both eyes corrected. Some of this group of course could be helped if seen in early childhood when the fusion sense might be trained and binocular vision obtained. If in a young person one eye is almost emmetropic, while the other has an high error of refraction, and the patient has no symptoms whatever from the eyes, and it is probable that he may never need glasses for the good eye until he becomes presbyopic, or if the more defective eye is moderately myopic, so that he may, by using it for reading never need glasses even at the presbyopic age, it is questionable whether it is necessary or wise to inflict such a person with glasses all his life when he may be as comfortable without them. If we should adopt such a plan, the patient should of course be kept under observation from time to time. Should any defect develop in the good eye, or should the patient begin to have any disturbance, ocular or reflex from eye strain, or should an imbalance of the muscles indicate possibly a developing strabismus, it would of course be necessary to correct the two eyes at once. Some persons go through life using one eye for distance and one for close work with perfect comfort, while any attempt to correct this inequality and make these two eyes work together causes them much annoyance and discomfort.

The third group includes those patients who, with the proper lens before each eye obtain binocular vision. It is in this class of anisometropic patients that we obtain our most satisfactory results. The earlier in life the attempt is made to correct the two eyes so that they may work together, the more easily will they do this, and with so much the less annoy-

ance or actual discomfort to the patient. Some adults, though obtaining excellent binocular vision, will not possess the necessary patience to endure the annoyance which is frequently inevitable in attempting to make two eyes work together, which have never done so or have done so only very imperfectly, and some few persons even after a fair trial will be compelled to give up the attempt. In my own experience these patients are rare, only three in the table of one hundred and thirteen cases, and most of them fail, not because success is impossible, but because they lack a little persistency.

We do, of course, meet some patients with anisometropia who never can obtain complete comfort, and especially is this true if the patient is also a marked neurasthenic (case 77), and yet this is not surprising, as we unfortunately all meet occasionally with patients possessing only a small error of refraction whom all the efforts of all the many oculists whom they consult fail to relieve of all eyestrain, or to enable them to use their eyes to any extent. We must be on our guard in such cases not to overlook some cause other than the eyes which is producing this asthenopia, as, for example, some pathologic condition in the nares or sinuses, gastro-intestinal disturbance or some uterine or ovarian trouble.

The condition of the muscles in anisometropia is interesting and the study of them important. The proportion of cases with muscle imbalance is as we would naturally expect higher than in patients whose eyes are more nearly equal. Any type of imbalance, esophoria, exophoria, or hyperphoria, may be found, and the amount may vary from a slight degree to a well marked squint, esotropia, exotropia, or hypertropia, and very frequently we find a combination of a vertical with an horizontal imbalance. Here, again, Duane has given a careful analysis of his cases. In regard to the presence of hyperphoria which is thought by some to occur with special frequency in anisometropia he found 15 per cent of the cases of low anisometropia and 32 per cent of the cases of high anisometropia had an hyperphoria of one degree or more. In one hundred and three cases of my own where the vertical muscle balance is given, there is orthophoria in 72 cases, 70 per cent; right hyperphoria in 23 cases, 22 per cent; left hyperphoria in 8 cases, 8 per cent. Total number of cases of hyperphoria, 30 per cent. As regards the lateral balance of the muscles, my

cases show, orthophoria, 29 cases, 28 per cent; esophoria, 47 cases, 45 per cent; exophoria, 28 cases, 27 per cent.

Certain difficulties are encountered in these cases of anisometropia. Many writers speak of the different size of the two images through such dissimilar glasses. "Inasmuch as the correcting lens placed at the anterior focus of the eye produces images on the retina of equal size in all forms of ametropia, no theoretical reason exists," says de Schweinitz, "for not correcting both eyes." As Duane points out, "If the mere difference in size and appearance of the two images is what gives trouble we should find in this an argument for, rather than against the correction of anisometropia," and by correcting it shall render of the same size the retinal images that before were widely unequal." He thinks, in fact, that this disparity between the retinal images constitutes one of the chief difficulties that exist when glasses are not worn, and furnishes one of the main reasons for prescribing them.

Another and much more real difficulty is in the prismatic effect from the lenses which will set up a muscular asthenopia or even produce diplopia. Certain precautions must be taken to guard against this as much as possible. The glasses must of course be centered with great care and two pairs, one for distance and one for prolonged reading, even though alike may sometimes be advisable. When lenses of different strength are needed for close work, there may be difficulty in ordering bifocals. In cases of antimetropia bifocal lenses as made by the average optician are usually wrong. With a convex lens for one eye and a concave before the other, and the ordinary segments placed upon these, on account of the location of the segments, there will be in the former lens the effect of prism base up and through the concave lens the effect of prism base down, with a resultant total vertical prismatic effect which will be most distressing to the patient, and render the use of the glasses impossible. This can, however, often be corrected by combining vertical prisms with the segments, base down in the segment for the convex lens and base up for the other segment, so as to bring the images as seen through the reading portions exactly on a line. This difficulty can be readily overcome by the old perfection bifocals, and of course no difficulty arises when we order a separate pair of lenses for close work. The lenses must be worn as close to the eyes as pos-

sible, and in these cases, if in any, we probably would be justified in trimming the eye lashes, as advised by Gould, so as to place the lenses nearer the eyes.

In some cases, as pointed out by Duane, "The patient finds difficulty in wearing glasses, not because the two lenses are different from each other, but simply because they are strong, and particularly because they contain strong cylinders." Another difficulty which he brings out is that the presence of a muscular deviation may be the cause of the patient's inability to use the glasses, but if the muscular condition is such that diplopia occurs, the glasses make matters worse by enhancing the distinctness of the two images.

The subjective symptoms arising from anisometropia are as varied as in other errors of refraction, and present nothing pathognomonic of the inequality.

In treating such cases, it is necessary to secure the full confidence of the patient, the condition must be explained to him, with the difficulties which he will probably experience in trying to wear the glasses. He must be willing to endure some annoyance and even actual discomfort at first, and must be both persistent and patient in wearing the lenses. By so doing he will usually become rapidly accustomed to the glasses, often within a week, though occasionally this process of adjustment will be much slower, and will severely test the person's patience and their confidence in us, and our own faith in our work.

It is needless to say that in the first place the refraction must be measured with extreme care, which, of course, means under thorough mydriasis, even at an age when ordinarily we would not think it necessary to use a mydriatic. In such patients, except in small children, I always prefer to make a post mydriatic measurement before ordering the glasses, especially if for any reason I decide not to give full correction. After the measurements of the eyes have been made my object is to give as nearly a full correction as possible. If one eye is hyperopic and the other myopic I would not give an absolutely full mydriatic correction for the hyperopic eye, just as I would not do so if both eyes were hyperopic, for that would mean poor distance vision with the eye which is usually the better one for distance. Duane, however, even does this, at least in some of his cases. If both eyes are hyperopic, in order to preserve the difference between the two eyes, and at

the same time give the patient fairly good distant vision with the more hyperopic eye I will often deduct considerably more from the full correction than if both eyes were like the good one and then possibly later on or even at once, if necessary, give another pair more nearly correcting the total error, for reading.

Occasionally a patient cannot wear the full correction for the more defective eye at first, but by beginning with a partial correction we can gradually increase the strength of this lens (as in cases 8 and 41). At other times, however, we find that while they like a partial correction for the more defective eye, they are rendered uncomfortable when a stronger glass is tried (as in case 69). While I am a firm believer in the full correction of astigmatism, I find in these cases of anisometropia that it is sometimes necessary to give only a partial correction, especially at the start (as in case 69 just cited and case 104). This was done in six of the one hundred and thirteen cases reported.

The question of the so-called dominant eye may be, as Gould suggests, important in this condition. The two eyes probably learn to work together more readily when the dominant eye is the more defective, though there may be more discomfort during the training period. On the other hand, when the dominant eye is the good one, there may not be as much discomfort or annoyance in wearing the new correction, but the patient is much more apt to continue using the good eye to the exclusion more or less complete of the other one. Gould (*Ophthalmology*, Volume 1, Page 12-14) in a paper on Dextrocularity and Sinistrocularity shows, "that the dominant eye will preserve its dominancy despite a considerably higher degree of ametropia than that of its fellow, and that an ametropia in the non-dominant eye which tends to throw it out of function is much more likely to result in non-function of that eye. For this reason it may be inadvisable to give the non-dominant eye an exceptional, or greatly superior acuteness of vision, or in fact even an equal acuteness of vision. Nature will not respond to the attempt so willingly as in a similar attempt upon the dominant eye." In regard to the question, which eye is usually the more ametropic, Schulin says: "Cases of anisometropia which are not complicated with a great amount of astigmatism have the right eye less hyperopic or

more myopic than the left," but Duane does not agree with him, and finds in the study of his statistics in this regard that the two eyes are about alike. In 138 cases of non-pathologic anisometropia O. D. was more ametropic in 70; O. S. in 68, and in 60 cases of high anisometropia, O. D. was more ametropic in 31, O. S. in 29. My own statistics would agree with those of Duane, as I found the higher refractive condition (higher myopia or less hyperopia) in O. D. 45, in O. S. 45. The greater error of refraction was found in O. D. 41, O. S. 40. The better vision was obtained in O. D. 32 times, in O. S. 31 times, the higher astigmatism in O. D. 34 times, in O. S. 25 times.

When there is some muscle imbalance we must not be too hasty to add prisms to our correction, as we find in some cases, after the patient has worn glasses for a time the muscular difficulty will disappear. In other cases it may be wise to give a partial correction for the imbalance so that the patient will have less difficulty at first in getting accustomed to the glasses and then remove the prisms later if necessary. Gymnastics for the ocular muscles may also be advantageous in some cases, especially for strengthening the internal recti. Rarely an operation may be necessary.

In the final analysis of our cases we find that many patients who could obtain no relief without glasses, or with glasses, which either did not recognize the difference between the two eyes, or corrected it only partially, are relieved of their symptoms both ocular and reflex by the glasses which correct the inequality between the two eyes. My own statistics in this regard show in the 113 cases reported the following results:

No attempt made to correct the inequality	3
Tried and gave up the attempt	3
No help	2
Doubtful	3
Partial relief	11
Greatly benefited	91

Of the two patients not helped by the glasses, one (case 77) has been an invalid, with a severe type of neurasthenia, for years. She has tried glasses from several oculists, and while I was doubtful whether lenses would accomplish any good, I felt that they should be given a thorough trial. She wears

them, and is better with, than without them, but they do not seem to have accomplished any particular good, either as regards the eyes themselves or her general condition. The other patient (case 87) seemed to derive no benefit from the glasses, but later reported to her physician, a neurologist, that she had been cured by Christian Science.

Of the three cases with doubtful results, one (case 35) was a great sufferer from headaches, but it was very doubtful whether these were due to the eyes; another one (case 66) simply reported that his eyes were still weak, but he did not say anything in regard to the ocular pain and headaches, and the third (case 108) reports by letter that he is "hardly able to say whether or not there has been any change for the better."

Three patients tried the glasses and gave them up, one a man, age 56 (case 19), tried them three months and then removed the lens from the defective eye and inserted a plain glass which he had worn before. Another, a man, age 59 (case 21), reported indirectly that he did not like them, but I never saw him after he had been wearing the glasses, and I do not know how long or thorough a trial he gave them. The attempt was possibly unwise in this case. He probably should have been treated as were the three for whom I made no attempt to correct the inequality, or one eye should have been adjusted for distance, and the other for reading, as he had been using them all his life. The third, a man aged 24 (case 27), tried them two months and then wanted the glasses made alike for the two eyes.

In conclusion, therefore, we are warranted, I believe, in making the plea urged at the beginning of this paper, that a greater effort be made in our cases of anisometropia to correct both eyes, as in so doing not only can many so-called useless eyes be preserved from further deterioration of vision, and be made to see and to share more or less in the work of the better eye, but the patient can be made more comfortable and relieved of ocular distress, headaches and other reflex disturbances..

Table of Cases of Anisometropia, Giving briefly the Symptoms, Refractions, Muscular Condition, Glasses Ordered and the Results.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
1	C. W. D.	31	M	dyspepsia, sick at stomach, headaches	Homatropin O D - 2.00, 5/7.5 O S + .50 C + .62 ax 180 5/9	Esophor 20 R H 1	O D (- 2.25) O S + .25 C + .62 ax 180	Improved
2	H. J. B.	32	M	Pain in eyes	1894 Homat O D - .25 C - .25 ax 180 5/4 O S - .37 C + .87 ax 80 5/4	Esophor 1, no H	ordered, first full, later - .25 added	relief
				Headaches	1902 Homat. O D - .37 C - .37 ax 180 6/5 O S - .75 C + 1.50 ax 80 6/6	Esophor 1, R H 1/2	order full	
					1907 Homat O D - .62 C - .50 ax 180 6/5 O S - 1.00 C + 1.75 ax 82 6/6	lat. orthophor R H 1/2	less .12 ordered with + 1.00 added for reading	relief
3	M. S. F.	54	F	eyes weak, occasional headache.	O D - 4.25 C - .25 ax 45 5/5 O S - 2.25 C - 1.00 ax 180 5/6	esophor 1, L H 1/2	ordered full with + 3.00 added for reading	comfortable.
4	O. H.	46	F	Pain in eyes and headaches after use.	1894 - first without my driatic. O D + 1.25 C + .37 ax 135 5/4	esophor 1/2 H 2	order full with + 1.00 added for reading	some dif. in getting accustomed to glasses

5	M L	53	F	Has had nervous prostration gen'l health bad Trouble at times with diplopia - recently glass repaired and found reversed	<p>O S - .50 C - 1.25 ax 135 5/5 1894, 8 mos. later with homat. O D + 1.75 C + .62 ax 135 5/5 O S + .25 C - 1.50 ax 135 5/6 1900 O D + 1.50 C + 1.00 ax 135 O S - 1.25 ax 120 + 6/12</p> <p>1894 O D + .25 C + 1.50 ax 105 5/5 O S + .75 C + .50 ax 115 5/5 1896 O D + 1.25 C + 1.25 ax 110 6/5 O S + 2.00 6/5 1905 O D + 2.00 C + 1.25 ax 120 6/5 O S + 2.25 6/5</p> <p>Homat O D - 7.00 C - .75 ax 165 5/5 O S - 3.00 C - 3.00 ax 25 5/5</p> <p>Homat O D - .25 5/4 O S - .25 C - .62 ax 75 5/4</p>	lat. orthophor	<p>Less 25 and order with + 1.50 added for reading.</p> <p>order full with + 2.00 added for reading</p>	greatly benefited' as regards headaches and ability to use eyes. head and eyes more comfortable but eyes sensitive and vary with gen'l condition - Has much disturbance of choroid, again helped but gen'l condition which is not good effects eyes.
6	F M	41	M	Sees poorly with O S frequent headaches	<p>Homat O D - 7.00 C - .75 ax 165 5/5 O S - 3.00 C - 3.00 ax 25 5/5</p>	esophor 1 1/2 no H	change so slight that glasses were not ordered but new segments + 2.50 added	Improved
7	E J R	25	M	Headaches (architect)	<p>Homat O D - .25 5/4 O S - .25 C - .62 ax 75 5/4</p>	esophor 2 L H 2 8 paresis of left superior oblique esophor 2 L H 12 still paresis of same muscle	order - full with + 2.50 added order full with 2° pr base up O D 2° pr. base down O S and 2.50 added	relief of discomfort
7	E J R	25	M	Headaches (architect)	<p>Homat O D - .25 5/4 O S - .25 C - .62 ax 75 5/4</p>	esophor 2 L H 2 8 paresis of left superior oblique esophor 2 L H 12 still paresis of same muscle	with + 1.25 added for reading pair to be worn constantly	beneficial
7	E J R	25	M	Headaches (architect)	<p>Homat O D - .25 5/4 O S - .25 C - .62 ax 75 5/4</p>	esophor 3 R H 2	order = full = constant	no more headaches and uses two eyes together with perfect comfort

No.	Name	Age	Symptoms	Refraction	Muscles	Glasses Ordered	Results
8	A J	27	F Pain in eyes, headaches blurring. 1898 Pain in eyes again 1904 Pain in eyes, some headaches	1896 Homat O D + .50 ax 90 5/5 O S - 8.00 C - 1.50 ax 180 5/9 1898 Homat O D - .25 C + 1.00 ax 90 6/7.5 O S - 10.00 C - 1.25 ax 180 6/12 1904 O D - .25 C + 1.25 ax 90 6/9 O S - 9C + 1.25 ax 180 6/9	lat. orthophor near and far R H 3 lat. orthophor to exophor 2 R H 3 esophor 2 R H 3-4	O D + .50 ax 90 O S - 5.50 C - 1.50 ax 180 O D - .25 C + 1.00 ax 90 C 2 pr. base down O S - 8.00 C - 1.25 ax 90 O D - .25 C + 1.25 ax 90 C 2 pr. base down O S - 9.00 C - 1.25 ax 180	eyes comfortable - no more headaches - works only by artificial light; some choroiditis in O S no dif. in getting accustomed to gl. which were great help. Eyes better but cannot use them much for close work.
9	A. K.	16	F dizziness, esp. after use of eyes	Atropin '96 O D - 2.50 C - .25 ax 15 5/4 O S + .25 5/4	esophor 1 1/2 R H 1 1/2	O D - 2.75 C - .25 ax 15 O S 1 pr. base up	glasses gave complete relief and in 1901 was still using same glasses.
10	J H C	41	M Some blurring poor V in O S	Homat O D - .50 6/5 O S - 2.50 C - .37 ax 75 6/5?	esophor 1 - zero no H	order - full 1 1/2 yrs later gave + 1.00 added for reading	glasses helped decidedly
11	W B	38	F Headaches, eyes tire	Homat O D - .75 C + 1.50 ax 90 6/6? O S + .37 ax 105 6/5	esophor 1, no H	order = full = constant	no more headaches and perfect comfort
12	M J M	24	F from gen'l health eyes ache, blurring, dizziness after use	Atropin O D - 1.50 C + 3.75 ax 105 6/9 O S + .25 C + 1.00 ax 75 6/6	esophor 3 L H 1/2	order = less .25s	gl. decided help but has some headaches.
13	C E S	22	artist, 1897 Jan. headaches, blur-	Atropin O D - .62 ax 135 6/5	esophor 20 no H	O D - .25 C - .62 ax	glasses decided help,

			ring, indigestion	O S - 6.00 C - .25 ax 165 6/6		135 O S - 4.00 C - .25 ax 165	no headache, can use eyes with perfect com- fort.
			Oct. 1898 discomfort again sl. vitreous opa- cities in OD. Has been greatly over working.	Atropin O D - .25 C - .50 ax 150 6/5 O S - 6.00 C - .25 ax 165	esophor 9 - 12	order = full = constant month later special read- ing glasses + 1.00s add- ed to each	glasses helped but ad- vised him to give up his very fine close work.
			1905 again hav- ing sick head- aches - typical migraine - had had none since previous meas- urement.	Homat. O D - .50 C - .62 ax 150 6/5 O S - 6.50 C - 1.00 ax 165 6/6	esophor 7 no H	order = full = distance special reading pair + 1.25s added.	
14	E R	19	F headaches, dizzi- ness	Atropin. O D - 3.50 C - 4.00 ax 180 6/9? O S - .50 C - 2.25 ax ax 20 6/9 +	esophor 6, L H 5 increased later to 8	order = full	no more dizziness, but a month later was still having headaches - Vertical prism advised but patient did not return.
15	F C J	35	M pain in eyes, blur ring, eyes be- come red.	Homat O D - .25 C + 1.00 ax 105 6/6 O S - 1.50 C - .37 ax 15 6/6	orthophor - es- ophor 1 no H exophor 7 inac- com, add 18, gym nastics.	order = full = constant	eyes much better -- uses glasses chiefly for close work.
16	J R W	33	F 1897. Pain in eyes, headaches pho- tophobia some choroiditis in each eye, worse in O D	Homat O D - 2.25 C - 1.25 ax 180 6/15 O S + 1.00 ax 100 6/6	orthophor - ex- ophor 1/2 no H	order = full = constant	headaches and all symp- toms improved, in 1907 reported no trouble with eyes - headaches rarely.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
17	H B G	22	M	eyes tire and burn after use worn gl. 8 yrs. with marked improvement of vision in O D	Homat O D + 5.50 \odot + 25 ax O S + 90 6/9? O S + 1.50 \odot + 75 ax 90 6/5?	orthophor RH 1	less .75s order =	Improved
18	E B	18	F	Headaches - blurring, eyes tire Trouble again for a year.	1898 - Atropin. O D + 1.75 \odot + 1.50 ax 75 6/6 - 2 O S + 1.25 6/5 1905 - Homat O D + 1.25 \odot + 1.50 ax 75 O S + .75 \odot + .12 ax 90	esophor 3 no H lateral orthophor no H	less 75 and order less 50 and order	no more headaches - perfect comfort in use of eyes. glasses satisfactory.
19	E B	56	M	headaches	O D + 2.75 6/6 O S + .37 axis 15 6/6	exophor $\frac{1}{2}$ - $1\frac{1}{2}$ (no H)	order = full = distance $1\frac{1}{2}$ with + 2.25 added for reading.	after 3 mos. trial, removed lens from O D and inserted plain glass.
20	C K	14	F	eyes tire after use, blurring.	1898 - Atropin. O D - 1.00 \odot - .25 ax 15 6/6 O S - .25 ax 165 6/6 1907 - Homat O D - 1.00 O S - .25 axis 180	esophor 2 no H esophor 3, no H	order = full = constant order - full	Beneficial too recent.
21	H A T	59	M	Eyes tire after use - first tried reading gl. 2 yrs ago but could find none to help	O D - 2.75 \odot - .25 ax 165 6/9 + O S + .25 \odot + .25 ax 90 6/5?	not stated	order = reading O D - .25 \odot - .25 ax 165 O S + 2.75 \odot + 25 ax 90	Did not like them, but I do not know how long a trial he gave them.

22	H H W	33	F	reading etc. makes her very nervous - eyes tire.	Homat. O D - 75 C + 1.50 ax 90 O S + 87 ax 95	exophor 5, R H 1	less 25 and order -	perfect comfort - less nervous, gen'l health improved.
23	G H S	60	F	Trouble with O D - consci- ous of it - con- fusion in vision - difference be- tween eyes cor- rected only in small part.	O D + 2.50 C + 1.00 ax 165 6/7.5 O S + 50 C + 25 ax 180 6/6	esophor 3, no H	order = full = distance + 3.00 added for reading	complete relief.
24	F B S	39	F	Wearing + 75 for each eye, eyes ache in cars - no discomfort in close work.	Homat 1899. O D + 2.75 6/6 O S + 4.00 ax 95 6/12	esophor 2 - 3,, no H	less 1.00s and order	considerable difficulty at first - then used them for close work with comfort, later con- stantly and as late as 1905 reports them very satisfactory.
25	A W	27	F	Headaches	Homat. O D - 37 C - 37 ax 180 6/5 O S - 1.00 C + 1.75 ax 90 6/12 - 1	lateral ortho- phor R H 1.	order = full	no more headaches, can use eyes with comfort.
26	G H M	50	F	Has been to many oculists cant see well with or without glasses.	O D - 3.00 C - 50 ax 135 6/5? O S - 6.00 C - .50 ax 75 6/5?	esophor 4-6 no H	order = full for distance with + 2.00 added for reading	much better and got along very nicely - very comfortable.
27	A F G	24	M	headaches and migraine no re- laxation to use of eyes but uses them h rd.	Homat. - O D + 3.50 C + 1.00 ax 90 6/15 O S + 1.75 6/5	lat. orthophor to esophor 2, no H Has binocular vision in reading	less 1, and order	after 2 mos. trial could not get accustomed to glasses and gave up attempt was given + 1.25 for each eye.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
28	F A S	45	M	can't see well at distance, tearing	O D + 2.25 6/5 O S + 6.00 6/22	not stated	O D + 2.25 O S + 2.25 4.00 very comfortable.	eyes better—so comfortable that he did not wish to try stronger correction; O S.
29	C H M	39	M	wearing correction for anisometropia—but some blurring, eyes sore.	Homat. O D — 5.00 C — .50 ax 105 6/15? O S — .12 C — .50 ax 105 6/5	cannot make any tests with maddox rod.	O D — 5.00 C — .50 ax 105 O S — .25 C — .50 ax 105	glasses comfortable.
30	W H C	28	F	headaches	Homat. O D — .50 C — .50 ax 105 6/5 O S + .25 C — 2.00 ax 75 6/5	esophor 1 — 2 R H ½	order — full — constant	glasses great help — 6 yrs later reports glasses still very comfortable but does not wear constantly.
31	H L B	21	M	eyes uncomfortable.	Homat. O D + 1.75 C + 25 ax 90 6/5? O S + 4.25 C + 25 ax 90 6/6	esophor 20, no H	less 1.00 and order	some trouble at first then glasses helped.
32	H B G	59	F	Headaches, pain in eyes light-headed at times wearing + 2.75 in each.	O D + 2.75 6/5 O S + 5.00 C + 50 ax 165 6/9	esophor 2 R H ½	order — full with + 2.75 added —	Had trouble with segments, removed these and gave her reading "fronts" then had no more trouble with the left glass and head felt all right.
33	S C K	22	F	Pain in eyes — pressure, blurring — diplopia	Homat 1901. O D + .25 C + 4.00 ax 95 6/75? O S + 1.00 C + .12 ax 90 6/5	exophor 1 — 2 R H 1 — no H. Has binocular reading vision	less 50 and order constant	after several wks annoyance, obtained complete relief. — In 1903 gave gymnastics for weak internal with benefit. In 1907 learn that she is perfectly well and has no trouble with eyes.

34	R F	9	F	Recurring inflammation of eyes.	Atropin, 1901. O D + 1.75 6/6 O S + 3.50 C + 75 ax 90 6/21	lat. orthophor to exophor $\frac{1}{2}$ L H $\frac{1}{2}$ - 1	less 1 and order. trained O S daily by covering O D	eyes slowly improved - attacks decreased in frequency - perfectly comfortable. 1904, V O D 6/5? O S 6/7.5 + complete relief.
35	J P B	29	M	Eyes smart O D 6/6? O S 6/45?	Homat. O D - 50 C - .25 ax 90 6/5 + O S - 2.25 C - .37 ax 90 6/5	lat. orthophor - esophor $\frac{1}{2}$ L H $\frac{1}{2}$ - 1	order = full constant	
36	W N B	27	M	occas. headaches - over-uses eyes - wearing gl. for his anisometropia but not correct.	Homat. O D - 1.50 C - 1.50 ax 180 6/9 + O S + .25 C + .12 ax 180 6/5	esophor $\frac{1}{2}$ no H	less .25 and order constant	no difficulty in wearing the correction for the two eyes.
37	M P E	26	F	Pain in eyes, blurring poor vision.	Homat. O D + .50 C - 1.50 ax 15 6/5? O S + 2.25 C - 3.75 ax 165 6/12	esophor 1, no H	less .25 and order constant	considerable difficulty at first - then perfectly comfortable and sees much better.
38	F J H	49	F	Eyes tire and can use them very little.	O D - .50 6/5 O S - 5.50 6/6	esophor 5-6 no H binocular vision in reading	order = full distance with + 2.50 added for reading.	glasses great help - eyes steadily gained and could use them with much more comfort.
39	A M F	53	F	Sees poorly - much headache never could get glasses to help her slight macula of left cornea.	1902. O D - .50 C - .50 ax 105 6/7.5? O S - .50 C - 2.50 ax 10 6/9 1907 O D - 1.00 ax 105 6/6 O S - 2.50 ax 10 6/7.5?	lat. orthophor no H	would not wear her distance glasses - reading gl ordered O D + 1.00 C + .50 ax 15 O S - 1.00 C + 2.50 ax 100	glasses great help.
						orthophor, no H	order = distance = for reading add + 2.25s	

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
40	C K	17	M	Headaches - O D aches - blurring, can read nothing smaller than 2M print with O D.	1902, Homat. O D + 2.00 \odot + 2.75 ax 90 6/15 + O S + .75 \odot + .25 ax 90 6/5	exophor $\frac{1}{2}$, no H convergence poor	less .75 and order con- stant, also train O D daily.	no more headaches, much helped. In 1904, V O D = 6/9 and can read 0.62 print with that eye.
41	W A D	45	F	F twitching about O S nervous.	Homat 1903. O D - .75 \odot - 1.50 ax 105 6/5 O S - 6.00 \odot - 1.00 ax 15 6/12	exophor 1 - lat. orthophor L H 1 - 2.	O D - 75 \odot - 1.50 ax. 105 O S - 5.00 \odot - 1.00 ax 15 added + 1.50 for reading, a year later gave full correction before left eye and added + 2.00 to each eye for reading.	Reading glasses all right from start, but had some difficulty at first with distance pair. Trouble at times with distance glasses, but not with reading.
42	D J C	35	M	great sufferer with headaches, fitted by numer- ous oculists - some of his head- aches prob. not due to eyes, es- pecially those occurring when he awakens in morning.	Homat. O D + 6.50 \odot + 2.75 ax 75 6/30 O S + 1.75 \odot + .50 ax 90 6/5	esophor 1, R H 1	less 1.00 and order con- stant	occipital headaches continue.
43	W D T	54	M	nervous depres- sion, cant work.	O D + .25 axis 75 6/5 O S - 6.00 6/6	lat. orthophor to exophor 3 R H 2 to 5	ordered O D + .25 ax 75 \odot 2 pr. base down O S - 6.00 + 2.00 added for reading =	got along finely and became perfectly well.
44	G S	43	M	some difficulty in reading. Had tried glas- but could not wear them.	Homat. O D + 50 \odot - 4.25 ax 85 6/9 O S + 75 \odot + 50 ax 180 6/5	esophor 3 L H $\frac{1}{4}$	O D + .75 O S + 1.00 \odot + .50 ax 180 Did not want to try cor- recting glass for O D	no further trouble.

45	C F D	27	M	Headaches, pain in eyes.	Homat. O D + .50 C + .87 ax 90 6/5 O S + .50 C + 2.50 ax 80 6/9	esophor 1/2 no H	less 50 and order con-stant.	no more headaches, — some difficulty in cer-tain work as carpenter.
46	D K A	31	F	Pain in and over O D cant see well — glasses not satisfactory	Homat. O D — 1.25 ax 90 6/9 O S + .75 C — 2.25 ax 150 6/6?	lat. orthophor no H	less 25 and order con-stant	no further trouble whatever.
47	D H B	74	F	Has had much trouble with eyes, numerous tenotomies, gen'l health poor, wear ing glasses alike for two eyes.	O D — 25 C — 1.00 ax 90 6/6? O S + 62 ax 180 6/6?	exophor 2, no H	order = full with + 2.50 added for reading.	Better.
48	M R	15	F	Headaches, nau-sea, both worse after use of eyes	Atropin. O D + 2.50 6/6? O S + 4.50 C + 50 ax 120 6/9	exophor 1, R H 1.	less 1.50 and order, pos-sibly stronger lenses later	no further difficulty.
49	A W	60	F	Frequent head-aches — pain in eyes.	O D — 2.00 C — 3.50 ax 30 6/12 O S — .75 C — 1.00 ax 120 6/6	esophor 2, no H	order = full = distance with + 2.75 bifocals for reading.	no more headaches and delighted with glasses.
50	J E B	24	M	Dizziness after use of eyes — headaches — blurring.	Homat. O D + 2.50 C + .25 ax 105 6/4? O S + 3.50 C + 1.00 ax 75 6/7.5	esophor 2, no H	less 1.50 and order	complete relief.
51	M F M	19	F	Headaches — eye-ache, eyes tire and burn.	Atropin. O D — 2.50 C + 3.25 ax 75 6/6 O S + 1.50 ax 105 6/6	orthophor to ex-ophor 2, no H	less 25 and order. A year later gave her gym-nastics for week internal recti.	glasses great help.
52	A S	47	F	Glasses not com-fortable.	O D — 2.00 ax 180 6/5 O S — .25 ax 15 6/4?	orthophor — eso-phor 1, R H 1/2 — no H	order = full = distance add + 1.75 for reading	glasses satisfactory ex-cept has difficulty in threading needle.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
53	A J	23	F	Headaches, pain in eyes—photophobia.	Homat. O D + 1.75 ax 100 6/5? O S - 2.50 C + 4.00 ax 85 6/7.5?	esophor 1, no H	less .50 and order	Better.
54	E K S	30	M	Eyes tired after use.	Homat. O D - 62 = - .25 ax 90 6/5 O S + 50 6/5	exophor 1/2 - esophor 1/4, no H	less .12 and order	glasses decided help.
55	H M	30	F	Eyes smart after use recently, and once before had trouble.	Homat 1904. O D + .25 C - 2.00 ax 180 6/5 O S + .37 ax 90 6/5	lat. orthophor no H	less .12 and order	used glasses only for close work and found them very helpful - 1906.
56	L L	55	F	Eyes tired - difficulty in close work - attacks of disturbed vision.	O D - 2.50 C - .75 ax 120 6/9 O S - 4.75 C - 25 ax 75 6/9	esophor 3, no H	order = full = distance with + 2.50 added for reading.	Relieved.
57	A T	43	M	Eyes tire after use, faint macula in left cornea.	Homat. O D + 4.00 C + 1.00 ax 90 6/9 O S + 1.75 C + 1.75 ax 90 6/9 - 1	esophor 2 no H	less 1, and order constant	decided help from glasses.
58	M M	22	F	Has tried numerous glasses without help, all alike for the two eyes, can't use eyes - tire - become inflamed.	Atropin 1904. O D + .25 C - 1.00 ax 180 6/5 O S + .25 ax 90 6/5 Atropin - 1905 O D + .25 C - 1.00 ax 180 O S + .37 ax 90	exophor 1/2, no H. abduction 9. adduction 12. exophor 1/2 - 1, no H.	order = full = constant. gymnastics for muscles less .12 O D + .12 C - 1.00 ax ax 180 O S + .25 C - .37 ax 180	Improvement, but slow. Better - become less inflamed - using them much harder - tire rather readily.
59	E J L	58	M	came with acute retro-bulbar neu	O D + .25 C + .50 ax 90 6/5	no record of muscles.	order = full = distance with + 2.25 added for	glasses perfectly comfortable and satisfactory

			iritis in O S - Treatment first - later refrac- tion.	O S + .25 C - 1.50 ax 180 6/6		reading.	
60	L M C	22	F Headaches, pain in eyes, blurring	Homatropin. O D - 3.75 C - .25 ax 180 O S - 1.50 C - 1.25 ax 165	exophor 1, no H	order = full = constant	Better.
61	H E R	60	F Eyes always dif- ferent, wearing plane glass be- fore O S.	O D + 1.25 O S - 2.00 C - .50 ax 45	exophor 4, no H	order = for distance with + 2.75 bifocals for reading.	Benefit for a yr - then beginning cataract in O S caused much an- noyance - increase of myopia in O S and glasses not helpful or comfortable.
62	A M S	60	M Eyes water with glasses, pain in eyes - some headaches.	O D - 1.00 C - 2.50 ax 180 6/22 O S - 3.50 6/12	exophor 2, no H	+ 50s added seems more restful - order distance. for reading - later O D - .50 C + 2.50 ax 90 O S - .50 C 2 pr. b in	glasses more restful, less pain and less tear- ing, though both pres- ent at times.
63	R H B	31	F Eyes tire - occas pain in eyes and headache.	Homat. O D + .75 axis 135 6/5 O S + 1.25 C - 5.00 ax 120 6/9	orthophor, no H	less .25 and order	glasses help.
64	R A D	39	F Eyes weak - tire after use, some headaches.	Homat. O D + .25 C + .37 ax 30 6/6 O S - 1.75 C - 4.00 ax 60 6/22	exophor 21, R H 9	O D + .37 ax 30 O S - 1.00 C - 4.00 ax 60	glasses help.
65	F H R	37	M Eyes tire - oc- casional head- ache - O D aches.	Homat. O D - .25 C + 1.50 ax 95 6/5 O S + .25 C + .50 ax 75 6/5	exophor 2, no H	less .25 and order, later ordered less 50 from full correction for distance	still had some difficulty O D feels strained. better.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
66	D L M	23	M	Pain in eyes - headaches, much trouble 3 yrs.	Atropin. O D - 3.75 ax 25 O S + .25 ax 90	lat. orthophor, no H	order = full = constant	eyes weak.
67	A W	22	F	constant head- ache.	Atropin. O D + 2.50 \odot + .62 ax 90 6/7.5 O S + 4.25 \odot + 1.00 ax 90 6/22	esophor 1, no H	less 75 and order con- stant	Improvement slow, but after 3 months better.
68	L H W	27	F	poor vision - headaches	Atropin. O D + 1.00 \odot - 10.00 ax 170 6/12 - 3 O S - 5.00 \odot - 3.00 ax 5 6/12 + 1	lat. orthophor, L H 2, no H	order = full = constant	Perfectly comfortable - sees much better.
69	L B W	25	M	Eyes annoying him, tire - nausea	Homat. O D + 4.00 ax 100 6/15 + 2 O S + .50 ax 90 6/5	esophor 4, no H difficulty in binoc- ular vision in reading.	ordered O D - .12 \odot + 2.00 ax 100 O S - .12 \odot + .50 ax 90 2 mos. later ordered O D - .25 \odot + 3.00 ax 100 O S - .25 \odot + .50 ax 90 90	no more nausea - per- fectly comfortable. Did. not like second pair and returned to first.
70	F N	27	F	sees poorly with O S, inflam. of it ulcer of cornea etc.	Homat. O D + .50 6/5 O S - .25 \odot + 1.00 ax 135 6/5	exophor 14-16 no H to R H 4	less 25 and order con- stant	Reports by letter that she is getting along finely.
71	H J	40	M	much headache - pain in eyes.	Homat. O D - .62 \odot - .62 ax 165 6/5 O S + .50 \odot - 2.75 ax 90 6/6	esophor 2, no H	less .12 and order con- stant, later gave + 75s added for reading.	Headaches entirely relieved - some diffi- culty in judging dis- tances, result not known

72	F T	27	F	headaches, dizziness, eyes feel strained - wearing plain glasses before O S.	Homat. O D - .62 C - .25 ax 150 O S + 3.00 C - 6.00 ax 5	exophor 1, no H a month later orthophor, no H	order = full = constant	less headache - eyes still tire but can use them much more.
73	W H B	61	F	needs new reading glasses - wears correction for both eyes.	O D - .75 O S - 75 C - 2.00 ax 80	exophor 1 - 1/2 no H	order = reading O D + 1.50 O S - .50 C + 2.00 ax 170	glasses help.
74	L M	20	F	Eyes tire - feel heavy - slow in focusing.	Homat. O D + 75 C - 2.75 ax 180 6/6 - 1 O S + 25 C - .62 ax 165 6/5	esophor 1/2 R H 1/4 - 1/2	less .12 and order constant	glasses marked help.
75	O M S	47	M	Recently some difficulty in focusing, blurring, strained feeling.	1899. O D + 2.50 C + .25 ax 180 6/9 O S + .75 C + .50 ax. 180 6/4 1903 O S + 1.25 C + .50 ax 180 6/5 1906 O S + 1.75 C + .50 ax 180 6/5	esophor 3, no H	ordered. O D + .75 O S + .75 C + 50 ax 180 + 1.50 added for reading order = with + 1.75 added -- order with + 2.00 added	Perfectly comfortable. Perfectly comfortable. Perfectly comfortable.
76	H W	7	F	Poor vision	Atropin. O D + 1.00 C + 1.25 ax 105 6/9 O S + 3.50 ax 105 6/15	esophor 3, no H	less 50 and order constant	no further trouble:
77	C F D	40	F	marked neurasthenia, severe headaches - photophobia - can use eyes scarcely at all.	Homat. O D + 37 axis 75 6/6 O S - 2.00 C - 62 ax 165 6/6	esophor 2, no H	order = full = constant + .50 added for reading	condition about the same but general health very poor.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
78	A H T	21	F	Headaches, worse after use of eyes.	Homat. O D + 3.75 C + .50 ax 120 6/6 O S - 1.00 C + 3.50 ax 90 6/12	orthophor - esophor 1/2 R H 1	less 1.00 and order constant	Headaches much better.
79	T F F	31	M	Headaches, eyes tire, blurring - has given up using eyes.	Homat. O D + .25 C - 1.00 ax 180 6/5 O S - .25 ax 180 6/5	exophor 1/2, R H 1/2	less .25 and order constant.	no more headaches nor pain - can use eyes with comfort.
80	O W	25	F	nausea and dizziness after use of eyes.	Homat. O D + 2.25 C + 1.25 ax 75 6/6 O S + 2.75 C + .25 ax 105 6/9	esophor 1/2, no H	less 1.25 and order constant.	complete relief.
81	M A C	37	F	Eyes pain after use treated in my hospital service 12 yrs ago	Homat. O D + 1.00 C + 2.00 ax 25 6/6 O S - 1.00 C + 5.00 ax 135 6/9 +	esophor 3, no H	less 50 and order constant.	Better again.
82	L C F	28	F	headaches worse after use of eyes - nervous, depression after eye use.	Homat. O D + .50 C + 1.50 ax 135 6/9 + O S + 2.50 C + 1.75 ax 60 6/7.5	exophor 2, R H 1/2	less 50 and order constant	headaches better less nervous.
83	L J P	51	F	headaches - eyes tire after use	O D + .37 ax 30 6/5 O S - 3.00 C - .50 ax 60 6/5	esophor 3, L H 1 - 2	order = full - distance + 2.25 added for reading.	glasses comfortable and very satisfactory.
84	E D L	43	F	Eyes tire after use, blurring	Humat. O D + 4.50 6/5 O S + 6.00 6/75	esophor 1 1/2 R H 1	less 1, and order = distance add + .75 to distance for reading	Had considerable difficulty in getting accustomed to glasses.

85	H B W	30	M	Eyes inflamed after use.	$OD - 2.00 \odot - .37 \text{ ax}$ 120 6/6 $OS + .50 \odot - .4.00 \text{ ax}$ 165 6/6	orthophor, no H	Practically no change from old glasses, but frames need adjusting.	Better.
86	Y J	29	F	Eyes feel strained and burn - sl. headaches.	Homat. $OD - 2.25 \odot + 3.50$ $\text{ax } 60 \text{ 6/9}$ $OS - .25 \odot + 50 \text{ ax}$ 150 6/6?	exophor 2, no H exophor 1 in ac- com.	order - full - constant glasses great help.	
87	J L	26	F	Headaches, pain in eyes, nausea and vomiting. inability to use eyes - trouble for yrs. and has been to many oculists - neurasthenia?	Homat. $OD - .50 \odot + 2.00$ $\text{ax } 165 \text{ 6/15}$ $OS + .75 \text{ ax } 120 \text{ 6/7.5?}$	exophor 3-4, almost no effort at convergence no H to R H 7. abd. 11: add. 0	less .25 and order constant.	glasses seemed to have no effect, but later reported that she had been cured by christian science.
88	W T P	30	F	Headaches, and also migraine	Homat. $OD - 3.00 \odot - 1.50$ $\text{ax } 135 \text{ 6/9}$ $OS - 2.00 \odot - 3.00$ $\text{ax } 50 \text{ 6/9}$	esophor 3, L H 1	+ .25s added and order	no more headaches.
89	M K	23	F	Convergent strabismus, some headaches, pain in eyes and blurring after use.	Atropin. $OD + 4.50 \odot + .25$ $\text{ax } 90 \text{ 6/5?}$ $OS + 3.00 \odot + 3.00$ $\text{ax } 120 \text{ 6/6}$	convergent strabismus.	less 1.00 and order constant, after some training did a tenotomy.	complete relief of symptoms. eyes in good position but wander in under cover.
90	L D W	26	M	Traumatic calaract in OS for 7 yrs. convergent strabismus 1 year, cataract removed.	Homat. $OD + 75 \text{ 6/4?}$ $OS + 9.00 \odot + 50 \text{ ax}$ 120 6/5	Diplopia at first fused by 30 prism base 6 prism base down 120 before O D	ordered $OD + 37$ $OS + 9.00 \odot + .50 \text{ ax}$ 120	considerable confusion of images at first, but at the end of two months the convergence was much less or scarcely noticeable with the glasses on.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
91	M D	39	F	Eyes do not focus alike, eyes ache — photophobia.	Homat O D + 1.25 \odot — 2.25 ax 170 6/6 O S — 62 ax 165 6/6	lateral orthophor to exophor 1, no H.	order = full = constant	no further difficulty
92	F C C	23	M	Blurring and smarting after use of eyes.	Atropin. O D plain glass 5/4 O S — 1.25 \odot — 75 ax 165 5/5	exophor 4 1/2 R H 1, add. 15	order = full = constant gymnastics for muscles.	complete relief.
93	H M	19	M	Daily headaches worse after use of eyes, blurring after use.	Atropin. O D + 1.75 ax 120 6/12 O S plain glass 6/6		order = full	Headaches much better and can use eyes with comfort.
94	C J W	23		Pain in eyes after use.	Homatropin. O D plain glass 6/5 O S + 1.25 6/5	esophor 1 at dist exophor 2 in accom, binocular vision in reading	order = full	Relief.
95	H P M	48	M	Frontal headaches, but apparently not due entirely to eyes. Glasses alike for 2 eyes.	Homatropin. O D — 1.25 \odot + 1.75 ax 165 5/5 O S + .25 ax 90 5/5	esophor 1, no H	order = full = distance with + 1.50 added for reading.	glasses helped considerably but he still had some difficulty with head which continued also with subsequent changes.
96	F L A	48	F	Headaches and eye pain after use of eyes.	Homatropin. O D + .50 6/5 O S + 1.00 ax 45 6/5	exophor 3, R H 1/2 — 1 exophor 5 — 6 in accom.	less 25 and order distance Reading — O D + 1.50 O S + 1.00 \odot + 1.00 ax 45	Reading glasses afford great satisfaction but does not use distance pair.

97	E B	25	F	nervous headaches—unable to use eyes at all for 2 yrs.—use for 1 or 2 minutes will cause severe pain and headache—some discomfort all the time—blurring.	Atropin. O D — .25 C — .37 ax 105 6/6 O S — 1.00 C + 2.00 ax 175 6/6	esophor 2½ R H ½	order = full = constant O D — .62 C + 37 ax 15 improved—can use them for an hour or more at a time—gen'l condition better.
98	E N	25	F	Sees very poorly—recently slight pain in O S Disturbance, of choroid	Homatropin. O D — 2.00 C — 2.50 ax 180 6/12 O S — 6.00 C — 2.00 ax 165 6/12	exophor 1, no H	order = full = distance add + 1.00 for special reading pair glasses perfectly satisfactory and comfortable.
99	P B	30	F	much frontal and vertex headaches.	Atropin. O D — 4.50 C — 1.00 ax 180 6/9? O S — .50 C + 1.00 ax 90 6/6?		order = full = constant Headaches helped at once, but for month glasses made her dizzy, after 3 months had no trouble whatever.
100	M D	11	F	Frontal headaches and pain in eyes—sees poorly.	Atropin. O D — .50 C + 2.50 ax 90 6/9 O S — .25 C — .75 ax 15 6/9		order = full = constant no more headaches—complete relief.
101	M C	42	F	Trouble in close work, Frontal headaches, eyes become red.	Homatropin. O D + 1.00 C — 4.00 ax 180 6/6 O S — .25 6/6		order = full = constant no more headaches and eyes much better but at end of month was still having some difficulty in using them.

No.	Name	Age	Sex	Symptoms	Refraction	Muscles	Glasses Ordered	Results
102	C L C	42	F	Some pain in O D also right side of head and occiput, worse after use of eyes, blurring.	Homat. O D + .50 C + 2.00 ax 5 6/6 O S + 2.00 C + .37 ax 180 6/5	exophor 1/2, no H	less .50 and order distance and add. + 1.50 bifocals for reading.	nausea and dizziness at first, still has some pain in O D - Difficulty at first in walking but no longer - gradually improving but is not wearing them constantly as ordered.
103	A G	55	M	wears glasses irregularly sees at distance with O S reads with O D.	O D - 2.25 6/5 O S - .75 6/5	esophor 1, R H 2	order O D - 2.00 O S - .50 C + 1 prism base up, add + 2.00 bifocals for reading.	wears glasses all the time and they afford great comfort.
104	M N	22	F	constant headache, worse after use of eyes O D poor for years	Homatropin. O D + 50 C + 6.00 ax 50 6/15 + O S + 3.00 6/5	eyes in good position.	ordered O D - .50 C + 5.00 ax ax 50 O S + 2.00	greatly benefited - headaches much better sees better.
105	H S D	50	F	some headaches eyes tire after use, does not see as well as she thinks she should	O D - .75 C + 1.75 ax 50 6/5 O S - .25 C + .25 ax 135 6/5	esophor 1, no H	order = full with + 2.00 bifocals for reading.	Reports glasses very satisfactory.
106	M R	44	F	much headache, blurring - diplopia when tired	Homatropin. O D + 50 C + 25 ax 90 6/5 O S - 1.50 C + 3.00 ax 90 6/12	exophor 2, R H 1, to no H	less 50 and order distance with + 1.00 lifocals	much benefit from glasses.
107	E M H	38	F	eyes tired all the time, ache some.	Homatropin. O D + 50 6/5? O S + 1.50 C - 3.00 ax 20 6/6	lateral orthophor, no H	ordered O D plain glass O S + 1.00 C - 3.00 ax 20	Eyes no longer tire glasses perfectly comfortable but had some difficulty at first in

108	F E D	46	M	glasses 8 yrs. regularly 3 yrs, but none very satisfactory - difficulty in focusing - blurring	Homatropin. O D + 1.00 \odot - 2.50 ax 100 6/5 O S + .25 \odot + .37 ax 165 6/5	exophor 1, no H	less 25 and order constant.	getting accustomed to them. writes that he is "hardly able to say whether or not there has been any change for the better."
109	T K	50	M	difficulty in reading, occasional headaches has had distance glasses which are still comfortable for distance	O D - 3.50 axis 180 6/9 + O S - .50 axis 180 6/5	exophor 1, no H	O D - 1.75 \odot + 3.50 ax 90 O S + 1.25 \odot + 50 ax 90 order = reading	Reports that glasses are very satisfactory
110	D T	64	F	Eyes tire and ache after use.	O D + 25 \odot + 1.00 ax 80 6/6 O S - 50 \odot + 2.50 ax 135 6/12	esophor 1/2 no H	order = full = distance add + 2.50 for reading.	"complete satisfaction"
111	M B P	34	F	Frequent headaches, eye balls feel sore, difficulty in reading music - very nervous.	Homatropin. O D + 3.00 axis 105 6/5 O S + .25 \odot + 5.00 ax 90 6/12	exophor 2, no H	less 50 and order constant.	most satisfactory - never goes without them.
112	W L D	54	M	Eyes hurt after use, some headaches, lids inflamed.	O D + .37c axis 180 6/5 O S - .25s \odot + 1.00c axis 175 6/5	exophor 1 1/2 no H	add + 2.00 for reading	reports glasses very satisfactory.
113	I K	15	F	poor vision - occasional pain in eyes.	Atropin. O D - 1.50 \odot + 2.00 ax 55 6/9 + 2 O S - 2.25 \odot + 4.50 ax 115 6/9	exophor 7, R H 1-2	order = full = constant	sees finely and has no discomfort whatever You 6/7.5

STASIS HYPEREMIA IN OPHTHALMOLOGY; THE THERAPY OF ULCUS CORNEAE SERPENS.*

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In the first communication¹ which I made concerning my experiments in regard to the influence of suction on the normal and pathologic eye, I was able to report a case of *ulcus corneae serpens* which healed very quickly and favorably under the influence of this treatment. Nearly a year has elapsed since then, during which time I have paid special attention to the treatment of *ulcus serpens* by means of suction, and I am now able to confirm my original findings.

In the beginning, it must be stated that all cases, even the very worst, were treated thus, the only restriction being that some cornea be retained. Even threatening perforation, or one already present, was no contraindication. In three cases of medium severity, however, the treatment could not be carried out on account of the resistance of the patients. These cases showed progress of the ulcerating process, and terminated in dense scar formation.

Before I take up the histories of the cases treated by suction, I desire to describe the method. In every case where no special indications were present, the only treatment in addition to the suction, was the instillation of atropin twice daily. No cauterizing, iodoform, moist-warm applications, subconjunctival salt injections, etc., were used, not because I deny the value of these methods, but because I desire to make my treatment as uncomplicated as possible.

The glass bells used for suction differ from those described in my first report, only in incidental features, since they were flat on top to allow a better view of the eye under treatment. Corresponding to this, the attachment for the tube was on the

*Translated from *Die Centralblatt für praktische Augenheilkunde*, May, 1907, by Clarence Loeb, A.M., M.D., St. Louis, Mo.

¹*Centralblatt f. prakt. Augenheilkunde*, June, 1906. Abstract in *Annals of Ophthalmology*, July, 1906, p. 468.

side. The most important of all, the opening for the eye, remained unchanged. As a rule, the treatment was twice daily, at first, each time for five to ten minutes, later, for thirty minutes, with an intermission of ten minutes. In several cases, the glass bulb did not remain in position ten minutes, and had to be applied several times. The applications were always made with the eye opened, so that the suction affected the bulb directly. If a perforation threatened or was present, a very slight rarefaction of air was employed, and the patient was constantly under the control of the physician. In all other cases, the patients could be left to themselves for the designated time (about ten minutes). I do not need to refer to the symptoms which appear during the application, since they were described before. Every case, however, showed distinctly an immediate remission in the pain, frequently very severe—it happened several times that the pain in the eye and head, which for days had kept the patient from sleeping, had disappeared after the first day of treatment. The method was never especially painful locally.

The function of the eye after the treatment is not given in the subjoined histories; therefore, I will state here that it in all cases corresponded to the opacity. Since this was usually central and covered the pupil, the vision was usually reduced to hand movements or fingers. Always, however, there was good perception of light at six meters, with projection and color perception, so that we could count on an artificial pupil giving a better and even serviceable vision, if a corresponding part of the cornea remained free. The cases were always progressive, i. e., they showed the so-called advancing border.

CASE I, 60 year old man, typical history. The ulcer lies in the outer half; diameter about 3 mm., hypopyon 1 mm., high; no dacryocystitis. During three days' treatment with the usual methods, the ulcer spread over the pupil, and the hypopyon rose to 3 mm. During the following fourteen days' treatment by suction, the ulcer cicatrized without spreading. The resulting scar extended from without scarcely beyond a narrow pupil.

CASE II, 45 year old woman, typical history. Treatment for fourteen days before admission by injections. Ulcer involving the center of the cornea, 6 mm. in horizontal, and 4 mm. in perpendicular meridian. Hypopyon 1 mm. high. No

dacryocystitis. Duration of suction treatment, eight days. The scar was 4 mm. horizontally by 3 mm. perpendicularly, and was distinctly delicate.

CASE III, 60 year old woman. Duration of disease ten days; untreated ulcer lay centrally, 4 mm. in diameter, hypopyon 3 mm. high. There was a dacryocystitis. This was treated by lavage, and probing of the nasal duct, and the ulcer by suction. In five days, the infiltration of the ulcer was distinctly less, nor had the latter extended. Since the patient objected to any further probing or lavage, the lacrimal sac was incised, the canaliculi were slit, and iodoform gauze was introduced into the cavity, while the suction was continued. The patient did not leave the dressing in place, however, and it was found displaced with the gauze pulled out, so that the pus from the sac had passed into the eye. As a result, the ulcer showed an exacerbation, so that slitting and cauterization had to be resorted to. The disease ended with an extensive destruction of the cornea, and a dense leucoma adherens.

CASE IV, 63 year old woman. Typical history. Duration five days without treatment. Ulcer involved the entire outer half of the cornea. Its floor was thin and ectatic. Hypopyon $1\frac{1}{2}$ mm. high. There was a dacryocystitis. The sac was at once extirpated. No favorable effect upon the disease by the suction could be noticed. The ulcer progressed, necessitating cauterization on the 4th day. In addition, the suction was continued. The cauterization was repeated twice. There was a perforation, and, finally, on the 15th day, there was a scar formed with incorporation of the iris, leaving only the internal-inferior part of the cornea free.

CASE V, 33 year old woman. Typical history. Duration eight weeks. Previous treatment, atropin instillations, moist warm applications, repeated cauterization. The ulcer lay in inner-upper quadrant, was 7 mm. in diameter, and involved the entire pupillary area. Hypopyon 2 mm. high. No dacryocystitis. Length of suction treatment six days. Scar delicate and distinctly smaller than was to be expected from the size of the ulcer.

CASE VI, 61 year old woman. Typical history. Duration twenty days. Previous treatment, injections and insufflation of powders. Ulcer lay in inner-lower quadrant; diameter 6 mm. extending over the pupil. Floor very thin, near to per-

foration. On the 7th day of suction treatment, there was a perforation. On the 15th day, the infiltration had entirely disappeared, without the ulcer extending superficially. The scar was transparent outward and downward, and upward.

CASE VII, 63 year old man. Typical history. Duration eight days without treatment. Ulcer in inner-lower quadrant, 5 mm. in diameter, reaching beyond the pupil. Floor very thin and bulging forward. Hypopyon 1 mm. high. There was a dacryocystitis. There was a perforation after two days of suction treatment, but no superficial extension of the ulcer could be seen. After eight days, the infiltration had disappeared, but the iris was healed into the wound. The dacryocystitis was treated by daily lavage and probing.

CASE VIII, 64 year old woman. No history of trauma. Duration fourteen days. Ulcer in lower half of cornea, 5 mm. in diameter. Hypopyon $1\frac{1}{2}$ mm. high. A small amount of mucous secretion could be expressed from the sac. After five days of suction treatment, the infiltration and hypopyon had almost disappeared. The next day, the ulcer suddenly progressed, and the hypopyon rose to 3 mm. Pressure on the lacrimal sac now yielded a large amount of pus. The sac was washed out. Nevertheless, the ulcer progressed, and the borders were cauterized. The hypopyon was removed by puncture of the cornea. After the wound had closed on the following day, the suction was again commenced, and the sac washed out daily. After four weeks of treatment, the ulcer had healed without incorporation of the iris. It had progressed since the beginning of the treatment to about 1 mm. beyond the center of the cornea.

CASE IX, 43 year old woman. No trauma. Duration thirteen days. Previous treatment consisted in injections, and dusting of powder. The ulcer, 8 mm. in diameter, lay exactly in the center, only the margins of the cornea remaining free. Hypopyon 4 mm. high. Mucous secretion can be expressed from the lacrimal sac. During the subsequent suction treatment, the ulcer remained stationary for six days; externally, however, a part of the progressive border was still visible. The floor of the ulcer was very much thinned, and a perforation occurred during the suction, on the 7th day. The infiltration had disappeared by the 10th day. The resulting scar

was much smaller and more delicate than was to be expected. There was no iris incorporation.

CASE X. 58 year old man. Typical history. Duration two weeks, untreated. Ulcer central, 4 mm. in diameter. Hypopyon reaches above pupil. No suppuration of lacrimal sac. After eighteen days of suction, the ulcer was completely cleansed, and the hypopyon resorbed. There are numerous posterior synechia. A delicate macula is to be seen at the site of the ulcer.

CASE XI, 54 year old woman. Typical history. Duration six days, untreated. Ulcer involving the lower half of the cornea, 5 mm. in diameter. Two foci of infiltration, size of a pin head, about 3 mm. from upper border of ulcer. Hypopyon, 3 mm. high. Dacryocystitis purulenta was present. Treatment: suction, atropin and syringing of sac. The next day, the foci of infiltration had become distinctly larger, necessitating cauterization. The progress was not checked, however, so cauterization was done twice more and incision once. In addition, the suction was continued. After two weeks of this treatment, the ulcer was healed. The scar was very extensive, affecting all except a crescentic part of the cornea.

CASE XII, 59 year old woman. Typical history. Duration three weeks. Previous treatment, injections and iodoform. Kidney-shaped ulcer, central, 4 mm. long by about 2 mm. in short diameter. A trace of hypopyon. No dacryocystitis. After seven days' treatment cicatrization commenced without any progress of the ulcer.

CASE XIII, 40 year old man. Typical history. Duration six days, previous treatment, atropin, iodoform. Ulcer 3 mm. in diameter, lying somewhat downward and inward from center. Hypopyon $1\frac{1}{2}$ mm. high. No dacryocystitis. After six days' treatment by suction, the hypopyon had disappeared, the ulcer was moderately infiltrated, without progression; two days later, the remainder of the infiltration was gone. The scar was very delicate and small.

CASE XIV, 66 year old woman. Typical history. Duration fourteen days, untreated. Ulcer below center, 9 mm. in diameter. Hypopyon $1\frac{1}{2}$ mm. high. Dacryocystitis purulenta was present. This was treated by syringing. In the early days of the treatment, the ulcer progressed inwards, and was cauterized several times. Finally there was an extensive destruc-

tion of the cornea with perforation, which resulted in healing, with a corneal fistula. The patient died of pneumonia before the fistula could be cured.

CASE XV, 71 year old man. Typical history. Duration two weeks, untreated. Ulcer 6 mm. in diameter, in the outer half of the cornea. Floor very thin. Hypopyon 2 mm. No dacryocystitis. For six days, no progression and hypopyon less; then slight extension upwards, which soon ceased. Furthermore, perforation was imminent, but was prevented by a small puncture. After three weeks of treatment, the ulcer cicatrized without incorporation of iris. The opacity did not involve a large part of the upper and inner part of the cornea.

CASE XVI, 60 year old man. Typical history. Duration six weeks. Treated every two weeks. Ulcer central, 4 mm. in diameter, hypopyon $1\frac{1}{2}$ mm. No dacryocystitis. Cure after ten days. Cicatrix smaller than original ulcer.

CASE XVII, 65 year old man. Typical history. Duration four weeks. Had seen a doctor once. Ulcer central, 3 mm. in diameter, loss of substance deep. Hypopyon filling half of the chamber. No dacryocystitis. Perforation on 5th day. Cicatrization until 15th day, with partial iris incorporation. The ulcer did not extend superficially.

CASE XVIII, 15 year old youth. Typical history. Duration one week, untreated. Ulcer 3 mm. in diameter, central, very superficial. Hypopyon 2 mm. No dacryocystitis. After fourteen days' treatment, cure, with delicate macula.

CASE XIX, 45 year old woman. No trauma. Duration ten days, untreated. Ulcer central, 3 mm. in diameter. Hypopyon 2 mm. Blenorrhea of sac was present. The sac was extirpated, and suction was at once instituted. In seven days, the ulcer was cured, with a delicate scar. The extirpation wound healed perfectly.

CASE XX, 50 year old woman. Typical history. Duration five days, untreated. Ulcer central, $1\frac{1}{2}$ mm. in diameter. Trace of hypopyon. Posterior synechiae. No dacryocystitis. In six days cured, delicate cicatrix remaining, no synechiae.

CASE XXI, 70 year old man. No trauma. Duration four days, untreated. Ulcer in center 3 mm. wide by 5 mm. high. Hypopyon filling half the chamber. There was dacryocystitis. Extirpation of the sac, then suction. No extension until 10th day. Infiltration much less. Then, perforation with iris pro-

lapse, which was cauterized. The healing again made good progress, and ended after eighteen days with a scar corresponding to the ulcer, with iris incorporation. The inner and outer parts of the cornea remained free.

CASE XXII, 35 year old woman. Typical history. Duration four weeks, treated by physician. Ulcer 7 mm. in diameter, central. Floor thin. Hypopyon filling half of the chamber. There was dacryocystitis. The sac was extirpated, and suction at once commenced. There was perforation the first day. The ulcer did not progress, and cicatrization had commenced the sixth day. The chamber, however, remained shallow, and the tension was decreased. Eight days later there was distinct increase of pressure which soon gave way to decrease of tension, i. e., a fistula. An iridectomy had the desired result, and led to closure of the fistula.

CASE XXIII, 45 year old woman. No trauma. Duration four days, treated by specialist with injections. Ulcer 4 mm. in diameter, central. Hypopyon 2 mm. No dacryocystitis. Four days after commencing suction, the infiltration had entirely disappeared, and the hypopyon was just visible. Three days later, cicatrization was starting everywhere, and yellow salve was used. The scar was distinctly delicate and small.

If we review these twenty-three cases, we find that the treatment was without result in only three cases, i. e., IV, XI, XIV. In all three, the ulcer was complicated with a purulent dacryocystitis, and this was probably the source of the infection. The sac was extirpated in case IV, and in the other two was only syringed. In spite of the usual treatment being employed in all cases, the process was checked only after extensive destruction of the cornea. After the original amelioration, the course later on became worse in Cases III and VIII. Here, too, the diseased sac played a special role. In Case III the exacerbation was coincident with the appearance of the dacryocystitis. In case VIII it coincided with the infecting of the conjunctival sac by the pus coming out of the artificial opening in the lacrimal sac.

In the remaining eighteen cases, the beneficial effect of the suction cannot be disputed, though severe as well as mild cases were treated. The average duration of treatment was about eleven days, though the cases were treated elsewhere for varying periods. The cases without dacryocystitis were distinctly

favorable. This is easily understood when we remember that the secretion from a diseased sac furnishes reinfection. No conservative treatment, therefore, can give certain aid. Only the immediate removal of the diseased organ cures the source of the infection. The bad results in case IV, so treated, must be due to the conjunctiva, infected from the lacrimal sac, furnishing the fresh infections. Unfortunately there was no bacteriologic examination of the ulcer, or the conjunctival or lacrimal sac secretion, though it would doubtless have been very interesting.

I should like to direct special attention to the distinct delicateness of the scar.

It cannot be excluded that the regeneration of the destroyed corneal tissue follows a more regular course under the influence of the suction than otherwise. Exact experiments would be useful here, and would considerably enrich our knowledge of the regenerative processes in the cornea. At any rate, the fact that the scar is more delicate and thus less obstructs vision than that following other modes of treatment, would of itself justify the introduction of suction into the treatment of *ulcus serpens*.

The treatment of the above cases was carried out with the greatest possible exclusion of other therapeutic measures which might have a beneficial effect on the course. It is not my purpose, however, to discard the old remedies. Every new one, however, that can exert a favorable influence on so destructive a disease, should be welcomed, and from this standpoint, I think the "suction" should be recommended in addition to the well-known remedies.

TWO CASES OF RECURRENT CONJUNCTIVITIS PRODUCED IN ONE, BY THE HORSE, IN THE OTHER BY THE CAT.*

S. D. RISLEY, M. D.

PHILADELPHIA.

The following histories are deemed of sufficient interest to be placed on record in the annals of this Society. Both came under my notice during the past week, and are briefly reported simply for the purpose of record in order that they may be added to the already published cases:

CASE I. Miss S., aged twenty-five, relates that she is unable to come into the near vicinity of horses without being immediately attacked by uncontrollable sneezing, stuffed nostrils, and profuse lachrimation. The eyes become bright red from the intense injection of the conjunctiva. After a few moments' exposure to the horses, the symptoms persist for several hours, and are followed by a longer period of discomfort during the gradual subsidence of the irritation and hypermia in eyes and nose.

The manifestation is so invariable that she prefers to walk from her home to the railroad station rather than to venture behind her father's horses, even in a closed depot wagon.

She regards the advent of the automobile with peculiar delight.

I have never had the opportunity to study the eyes during one of these attacks, and am therefore unable to describe with accuracy the condition of the mucous membrane.

CASE II. Miss R., aged seventeen, relates that for a period extending over five, or, possibly, six years, any attempt to fondle a cat, brought on almost immediately, profuse lachrimation. The tears would stream down the face, and the eyes would become inflamed, i. e., bright-red. The nostrils would also become involved, but apparently secondarily, the primary

*Read before the American Ophthalmological Society, Washington, May, 1907.

attack falling upon the eyes and with great severity. If the cat were taken into her lap and stroked persistently, the symptoms would last an hour or longer, but if the cat were removed immediately, the duration was much shorter. The presence of a cat moving about a room was not sufficient to produce the symptoms, but if she simply stooped over and stroked the cat, the lacrimation came on immediately. After five or six years this peculiar susceptibility disappeared without treatment of any kind. Her health was good. She is not a victim of hay fever or rose cold, nor did the presence of any other animal produce the attacks of conjunctivitis.

The above histories were presented at the meeting of the American Ophthalmological Society, in Washington, May, 1907. In the discussion which followed their presentation, Dr. W. C. Posey, Dr. Walter L. Pyle and Dr. Edward Jackson alluded to cases which occurred in their practice, and which had already been published. Within the past month, a third case of conjunctivitis, with nasal symptoms, produced by the dog, came under observation. In this case a gentleman was invited to dine by one of my personal friends. To her surprise he accepted the invitation upon the condition that there were no dogs about the house. She replied that she had a small Spanish poodle, but that he would be sent away early in the morning, and kept from the house until after the dinner.

The guest came, and all went well until the close of the dinner, when he began to sneeze, and was suddenly attacked with profuse lacrimation and dread of light. He at once said there must be a dog about the house. Upon investigation it was found that the small poodle had escaped from his temporary residence with a neighbor, entered the house by way of the kitchen and was then crouching in the buttery or serving room, which adjoined the dining room.

1728 Chestnut St.

UNILATERAL EXOPHTHALMOS IN A NEW BORN INFANT.*

W. H. PECK, M. D.
CHICAGO, ILL.

I was called in consultation with Dr. Raach of Wheaton, Illinois, January first, of this year, to see a male infant born two days before, who was suffering with an exophthalmos of the right eye, which had existed since shortly after its birth.

The history of the case was negative, the mother of the child, who was a finely formed woman, had previously given birth to five healthy children, who were all alive; all deliveries, including the one reported, occurring without instrumental aid, in less than three hours. There was no abrasion, discoloration, swelling nor indication of a fracture of the head.

Standing back of the child and looking down over the brows, the affected eye was seen to protrude one-eighth of an inch farther forward than the left one. The baby could move the eye in unison with the other, and could also close the lids, thereby excluding paralysis. The pupil reacted promptly to light and the tension was normal, but the globe could not be restored to its normal position. I dilated the pupil and made an ophthalmoscopic examination, and found the media and fundus normal. There was no increase in the size of the eyeball. A careful examination was made for pulsation and a bruit, but with negative result. There was no indication of trouble in any of the sinuses. The child was well nourished, and no enlargement of the glands could be found.

I advised waiting for developments and saw the child two days later, at which time I found the eyeball protruding one-fourth of an inch in advance of its fellow, and freely movable. The child was able to close the lids when the cornea was stimulated, but otherwise the lids remained open most of the time, exposing a great deal of the sclera.

*Read before the Chicago Ophthalmological Society, March 11, 1907.

The cornea had become excoriated. Three days later the proptosis was very much worse, and once, when the nurse held the child over her arm with its face turned toward the floor, the eye extruded so far that I expected to see the complete luxation of the globe.

Four days later the exophthalmos had not increased, and in one month had entirely disappeared. At the present time the child is apparently perfectly well.

I was especially impressed with the possibility of the condition having been caused by vascular obstruction and remedied by the establishment of collateral circulation.

67 Wabash Ave.

ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

(UNITED STATES OF AMERICA.)

BY

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**The Eyes and Eyesight of Birds, With Especial Reference to the
Appearance of the Fundus Oculi.**

WOOD, CASEY A., M. D., Chicago (*Ophthalmology*, April, 1907), has made a very valuable contribution to the comparative anatomy of the eye. He justifies his work by the light that is thrown on the anatomy and physiology of the human eye, by the study of the eyes of the lower animals, and especially of the birds, whose eyes exhibit the highest development of the visual sense. The third eyelid, seen in the retrograde form in man, finds its highest development in birds. It serves to scrape the cornea and, in connection with the gland of Har-dee, which is placed beneath the membrane and functions with it, to cleanse and protect the cornea. It also screens off excessive light. The anterior chamber is deep and the cornea more conical than in the human eye and this shape is continued into the sclera. The ocular walls are much strengthened by the overlapping horny plates of the anterior segment of the sclera and by a cup of hyaline cartilage which encloses the

posterior half of the eye. In the majority of birds the pupils are round and of a most remarkable mobility. In some nocturnal birds, however, the pupil may be contracted to a vertical slit, probably when the animal accommodates for near. The Ligamentum Pectinatum is an elaborate organ, the canal of Schlemm is proportionately large and the ciliary body is not the only source of intra-ocular fluids and of the nutritive supply of the lens. While some accommodative changes in the shape of the lens may be accomplished as in the human eye, yet the principal change in accommodation is produced by an intra-ocular band, that encircles the bird's eye about the equator, known as the circular muscle of Crampton. This ring contracts, the unyielding walls of the globe direct the pressure forward, the ciliary muscle relaxes, and the increased internal pressure pushes the lens into the anterior chamber. At the same time the pecten fills with blood and swells and the cornea becomes more convex. For distance vision the process is reversed. This change may be very rapid. The crystalline lens is globular and capable of marked variation in form. The most peculiar organ in the whole ocular apparatus of birds is in the Pecten. This pigmented, irregular, solid, erectile body extends from the optic disc of every bird into the vitreous, nearly to the posterior surface of the lens, and is composed of large vascular trunks, about which are arranged smaller vessels with cellular walls, all bound together loosely by connective tissue and covered with a smooth, thin, homogeneous, pigmented membrane. It carries the nutrient vessels of the retina and its erectile nature enables it to assist in accommodation, as already explained. The hyaline artery of foetal life is probably a vestigial pecten. Each eye may have one or two macular regions, each with its fovea, thus providing for complete binocular vision in each eye of hawks and other birds of prey—including insectivorous birds. This explains the wonderful range and accuracy of birds like the eagles, hawks and vultures. The refraction of wild birds is usually hypermetropic, but the domesticated species tend to become short-sighted, astigmatic or both, and to present evidences of intra-ocular disease. A. F. A.

On the Perception of Sight and Color.

IRERSHOFF, A. E., Cleveland, O. (*Ophthalmology*, April 1907). After discussing retinal anatomy and physiology

and general nervous phenomena, the writer calls attention to the two varieties of nerve end organs in the eye, the rods and cones, and the fact that the presence of these two types would lead us to anticipate at least two distinct sensations. Such seems to be true in the eye; the rods seem to produce luminous sensation and the cones visual sensation. The character of each is discussed and the role of the purple rod pigment and its chemical decomposition and renewal are described. The development of electro-motive force and its relation to the decomposition of rod purple and its action in stimulating the rod function is clearly set forth. Luminous sensation is clearly the function of the rods and their contained purple pigment, for it is absent where the rods are absent. This is perception of light but not of form. Stimulation of the rods by light of any color whatever gives rise to the sensation of faint white or gray. Their independent action never gives rise to color sensation. The cones, on the other hand, contain no demonstrable light sensitive pigment and are not equipped for rapid recuperation of their functioning power. Their activity is aroused by greater stimulation than is necessary for rods. Clear appreciation of form is from this activity of the cones under greater light stimulation. The coincident activity of both rods and cones gives color phenomena and such phenomena are absent if either rods or cones are absent or defective.

A. F. A.

Coloboma of the Lid, With an Anomalous Condition of the Tissues at the Outer Commissure.

POSEY, W. C., Philadelphia (*Ophthalmic Record*, April, '07), describes a case of coloboma of the lid with an anomalous condition at the outer commissure in an otherwise healthy girl ten years old. The coloboma, as shown in the illustration, was a typical one of the upper left eyelid, so formed that when looking straight forward the cornea fitted exactly into the aperture of the lid, the outline of which was rounded in conformity with the corneal limbus. Above the coloboma was a small yellowish thickening of the skin. The cornea was clear. At the outer angle of the eye was a thickening of the tissue, apparently dependent upon some formation in the capsule in the outer angle of the eye and the reflection of the fascia to the rim of the orbit. The bulbar conjunctiva covered this mass, which was grayish-white, smooth and flat. On inward rota-

tion of the eye with the lids separated, the formation assumed cylindrical form and moved readily with the globe. Externally, the mass was lost in the tissues of the commissure. Internally, it was bound to the globe by a sharp line of demarcation. There was a similar, but smaller, mass in the outer commissure of the right eye.

The writer intends to operate on this case in the following manner: To separate the skin at the edges of the coloboma from its sub-lying tissue and then to perform an external canthoplasty so as to lengthen the fissure and relieve the tension of the lid; to evert the lid and draw the cartilaginous edges of the coloboma together with fine sutures. The line of division between the cartilages will then be covered by two flaps to be obtained from the lid as shown in an illustration.

O. W.

A Study in Atavistic Descent of Congenital Cataract Through Four Generations.

STIEREN, EDWARD A., (*Ophthalmic Record*, May, '07), gives an interesting account of an atavistic descent of cataract through four generations including 78 offspring, 17 of whom were born blind.

The earliest traceable ancestors of this family had normal eyes. All of the children born blind died in infancy, some being hydrocephalic. One branch of the family now under the personal observation of the writer shows rachitic tendencies, the mother has an enlargement of the thyroid gland and her youngest child is decidedly rachitic.

The descent of the cataractous lens in this family was not direct, as the affected offspring died at an early age. The transmission was invariably from mother to son, each married female in the connection, with one exception, had male blind offspring.

O. W.

Dissection of the Lens for the Correction of High Myopia.

POSEY, W. C., 'Philadelphia (*Ophthalmic Record*, April, '07), describes a dissection of the lens for the correction of high myopia. The patient, a school girl aged 16, had had poor vision since childhood. Both eyes were highly myopic, the fundus being best seen with —18 D. There were broad staphylomatous areas at the outer border of each nerve, but the macular regions were fairly healthy, although there was disturb-

ance of pigment in that region. The media were clear, uncorrected vision equaled $1/60$ in the right eye and $2/60$ in the left. The right lens was cautiously needled on several occasions without undue reaction. Absorption of the lens mass was comparatively rapid. Five months after the primary discission, vision in the operated eye equaled $6/24$ without a glass, and with + S. 2.75 D., Type 0.75 D. was read without difficulty at thirteen inches. O. W.

The Present Status of Preliminary Iridectomy as Related to Cataract Extraction.

REBER, WENDELL, Philadelphia (*New York Medical Journal*, April 6, 1907), sent the following questions to one hundred and sixty American ophthalmic surgeons: 1. Do you ever perform preliminary iridectomy? 2. For what conditions? 3. Why? 4. If a cataract patient has lost one eye by operation (or whatever cause) would you do preliminary iridectomy if the patient's time would permit? and if so, why?

One hundred replies were received. Of this number eleven surgeons understood that artificial ripening was the question under discussion, and their replies unfortunately could not be used. Of the remaining eighty-three, forty-seven believe that for most cataracts preliminary iridectomy is a safer procedure than combined or simple extraction; nineteen more believe that preliminary iridectomy is the safer thing to do in the presence of complications; and seventeen feel that the chances of success for their patient would be in no wise enhanced, but somewhat jeopardized by preliminary iridectomy. Reber discusses the operation very thoroughly, and is enthusiastic in its favor. M. L. F.

The Relation of Certain Abnormal Ocular Conditions to the Etiology of General Neuroses, e. g., Epilepsy, Chorea.

SEMPLE, N. M., (*The American Journal of Ophthalmology*, Dec., 1906), after discussing at some length the diversity of opinion on this subject, reports three cases. The first was a female, married, seventeen years of age, who suffered from attacks of semi-consciousness, often preceded by severe headaches, nausea and vomiting, which were improved after she had worn for a week a correction of O. D. +1.00C ax. 90° and O. S. +0.50S \subset +0.50C ax 90° giving a vision of 20/15 in either eye. Peripheral muscular spasms were also lessened.

Semple states that the patient was decidedly neurotic and seemed to be of the petit mal type. The "cure" has lasted three years.

The second case was that of a boy of ten, undersized, of a quick mental temperament. There was a history of convulsive seizures, with unconsciousness and foaming at the mouth, followed by lassitude lasting several hours. While looking at the blackboard in the school he would suddenly have a severe seizure. The mother was known as a "peculiar" woman. The refractive error was O. D. $-2.00S \subset +3.00C$ ax. $105^\circ = 20/15$, O. S. $-2.00S +4.50C$ ax. $80^\circ = 20/15$. Glasses were prescribed with a subsequent cessation of attacks, the mother, however, attributed the improvement to a dose of worm medicine given at the time the glasses were first worn, and Semple states that her opinion was not altogether unscientific.

The third case reported was a boy of fourteen years, subject to epileptic attacks since nine years of age, which began with sensory aura in the left hand. The attacks could at times be prevented by firmly gripping the hand. Correction in O. D. was $+3.50S$, giving $20/24$, and in O. S., $+3.75S = +0.75C$ ax. 75° allowing $20/15$.

In the right eye the field was cut in half to the nasal side while that of the left was normal. There was a white atrophy of the disk corresponding to the field. Semple diagnosed an organic lesion of the cortex—a condition hardly curable by means of glasses.

Semple concludes by stating that the possibility of proper correcting glasses benefiting epilepsy must be admitted, but thinks the extreme claims of Gould, Stevens and Ranney have antagonized the neurologists to a great extent. He suggests that in children there would be more possibility of relief, owing to the fact that in later life the nerve centers become sclerotic or even destroyed.

F. C. P.

Ocular Manifestations of Rheumatism and Gout.

SHOEMAKER, W. A., (*The American Journal of Ophthalmology*, Jan., 1907), states that rheumatic fever affects the eye less frequently than does gout or the chronic form of rheumatism. Among the ocular conditions which have rheumatism or gout as an underlying cause, are recurring chalazia, hordeola and marginal blepharitis, conjunctivitis with hot and itch-

ing eyes associated with episcleral congestion, episcleritis and scleritis, tenonitis and glaucoma. Inflammation of the ocular muscles is rare. Muscular imbalance, paralysis and paresis of the extra or intra ocular muscles, orbital periostitis and cellulitis, osteoma, acute retro-bulbar neuritis, cataract (?), iritis, cyclitis, chorioiditis and keratitis may all have the rheumatic or gouty diathesis as a causative factor in their development.

Shoemaker cites a case which occurred in his own practice. A girl aged 14 had had pain in her right shoulder for some years. During the four months previous to examination, frequent attacks of pain in the right eye were present, accompanied by photophobia and lacrimation, seemingly dependent upon weather changes. Examination showed a slight ciliary tenderness with active pupils. A slight diffuse haziness of the substantia propria was discernible by means of oblique illumination. Atropine promptly dilated the pupil. With a plus 20 D lens no special haziness appeared, but the pupillary reflex was broken up by lattice-like transparent streaks which appeared to be engorgements of the lymph spaces with infiltration of some of the adjoining lamellae. The fundus was negative. A diagnosis of congestion of the substantia propria, probably due to rheumatism, was made. Under anti-rheumatic treatment the symptoms subsided in a week and remained so until two years later, when a similar attack was experienced, which subsided under treatment, with still another attack one year following. One year later the patient complained of blurring and pain in the right eye. A hazy vitreous and a good-sized spot of chorio-retinitis in the upper temporal quadrant, presented themselves. Treatment consisted of sodium salicylate, bichloride, potassium iodide and iron, and extended over a period of about four months during which time the vision improved from 6/200 to 13/15. Ten months later there was considerable pain and the four chlorides were prescribed. Patient progressed nicely for two years, when a fresh spot of chorio-retinitis appeared near the site of original trouble. There was no rheumatism, and the general health was good. Soluble iodine and bichloride were administered with a betterment of the condition. One year later the patient stated that her vision had improved and at that time she was apparently in fair condition.

Shoemaker concludes by stating that this seems to have been a primary involvement of the substantia propria, due to chronic articular rheumatism, with a subsequent affection of the choroid and retina without involvement of the cornea. He is convinced of the absolute truthfulness of the statement that recurrent attacks were very common.

F. C. P.

Severe Ocular Pain Associated With Grippe.

KRALL, JOHN T., Philadelphia (*New York Medical Journal*, April 27, 1907), claims that there is an increasing number of cases of endemic influenza vera complicated by a sudden seizure of excruciating pain located in the eyeball, lasting two or three days, unattended by any symptoms of inflammation, while the eyeball and its appendages present a perfectly normal appearance. Diagnosis is neuralgia of the ciliary nerves, due to toxines circulating in the blood acting upon the nerve centers or fibers.

M. L. F.

Ocular Disturbances Due to Pressure Upon or Stretching of the Cervico-Dorsal Sympathetic.

DUNN, JOHN, Richmond, Va. (*Archives of Ophthalmology*, May, 1907). The writer reports three cases in which the visible ocular symptoms were the same, and in which the subjective symptoms varied only in degree. The objective ocular picture and the subjective symptoms are both the result of chronic disturbance of the cervico-dorsal sympathetic. The cases all complained of inability to use their eyes with comfort in reading, writing or sewing. There were no visible changes in the fundus, and correcting glasses for refractive errors produced normal vision. In none of the cases did correcting glasses give comfort. In some ciliary spasm was marked, and in others photophobia was complained of. In all except one there was cervico-spinal curvature. The writer does not attempt to explain the production of the symptoms; he believes that we have to deal with either partial paralysis or chronic irritation from stretching or pressure of the oculo-spinal sympathetic. He has had no opportunity to determine in what proportion of cases of lateral curvature of the cervico-dorsal spine the ocular symptoms described are present. That they are present in some cases is important, for the recognition of the cause of their production serves to explain why treatment applied to the eye fails to give relief.

H. G. G.

A Case of Monocular Ophthalmoplegia Interna and Externa, With Paralysis of the Abducens and Trochlearia.

LANDMAN, OTTO, Toledo, Ohio (*Archives of Ophthalmology*, May, 1907), reports a case which is of interest because of its complete recovery and because it shows the possibility of a lesion causing pressure in the superior orbital fissure and compressing adjacent structures without involving the optic nerve. A brief history of the case follows: The protrusion of the eye came on suddenly, there was pain day and night, most severe at night. The diplopia lasted for more than seven weeks, the fundus was normal and also the vision, except that at one examination there was a spasm of the ciliary muscle which produced a myopic refraction. Contrary to the rule there was intense neuralgia. The gradual implication of the muscles is of interest: first, a ptosis, three days later, an ophthalmoplegia externa; five days after this, an ophthalmoplegia interna; followed, after an interval of three more days, by a paralysis of the superior oblique and external rectus and marked exophthalmus. It was remarkable how quickly all the pain subsided after anti-syphilitic treatment was begun. The cause was probably a gummatous process in or around the superior orbital fissure, which produced pressure. From a review of the cases reported the prognosis appears to be very favorable when syphilis is the cause. The writer's patient made a complete and perfect recovery within two months.

H. G. G.

Staining From Argyrol Employed in Diseases of the Conjunctiva and Lacrimal Apparatus.

MOULTON, H., Arkansas (*Ophthalmic Record*, April, 1907), reports a case of instantaneous staining by argyrol. The patient, a woman, 46 years old, was being treated for epiphora of the left eye. After dilating the lower punctum, three or four drops of 25% solution of argyrol were introduced. Almost immediately a dark stain appeared over the location of the sac and extended over the cheek and brow; there was also pain and swelling which lasted for a few hours.

An attempt was made to aspirate the solution remaining in the sac, and then to decolorize with bichloride of mercury solution 1-3000 injected into the canaliculus, and later, iodide of potassium was administered internally for some time. The stain was very intense for several weeks and then gradually

faded for a few months, but is now stationary, and is merely an intensification of the normal discoloration of the patient's other eye. The stain on the upper eyelid has faded out completely.

O. W.

Obliteration of the Orbital Cavity In Trachoma of the Conjunctival Sac.

SYNDACKER, E. F., Chicago, Ill. (*Ophthalmology*, April, 1907). The patient had lost her left eye during childhood and had for many years been afflicted with severe trachoma of the conjunctival sac. Contraction had so nearly closed the sac that a prothesis could not be worn. A previous plastic operation had proved ineffective and the entropion, constant pain and irritation of the annoying discharge had rendered her very uncomfortable. The operation was undertaken at her suggestion to obliterate entirely the sac. The whole mucous membrane, lacrimal and accessory glands, lashes and hair follicles were removed and the lids sutured together. At the end of a week the cavity was completely covered with skin and her discomfort from an inflamed and secreting cavity was entirely abolished.

A. F. A.

Epithelial Inclusion Cysts of the Conjunctiva.

OATMAN, EDWARD L., Brooklyn, N. Y. (*Archives of Ophthalmology*, May, 1907), reports the following case: A boy twelve years old underwent the operation of trachoma expression, three months later a tense, semi-translucent cyst, about the size of a split pea, was seen on the conjunctival transition fold of the lower lid. The cyst was opened and a clear fluid evacuated. It soon reformed and was then excised. The microscopic examination showed it to be a serous cyst, lined internally with epithelia of conjunctival origin, which were young and actively proliferating. The cyst contents were a slightly albuminous fluid, degenerated epithelia and cellular detritus. The mechanism by which these cysts are formed undoubtedly varies, but the essential feature is the segregation of some cells from the surface epithelium by inclusion in the substantia propria of the conjunctiva. This is brought about by special conditions, an ideal one being the operation of trachoma expression. When the conjunctiva is inflamed, the concomitant swelling of the substantia propria and sub-conjunctival connective tissue serves to increase the depth of the conjunctival

crypts and furrows and to bring the surfaces of conjunctival folds into apposition. The squeezing and stripping to which the conjunctiva is subjected during mechanical removal of trachoma granules, necessarily tears off irregular patches of epithelium, or, if the operation is roughly performed, the membrane itself may be shredded or removed. Subsequent proliferation and degeneration of cells isolated in this manner will result in cyst formation. The treatment is ablation.

H. G. G.

Parinaud's Conjunctivitis.

SHOEMAKER, J. F. (*The American Journal of Ophthalmology*, Dec., 1906), after reviewing the reported cases, cites a case of his own. A boy of eleven years of age presented himself with a slightly inflamed eye of two weeks' standing. One week after the onset, the lids and the corresponding side of the face began to swell, until at the time of examination there was found a marked swelling of the lids of the left eye and of the whole side of the face. Conjunctival injection with chemosis to the temporal side was present. Eversion of the upper lid showed large polypoid vegetations of the conjunctiva over the tarsus and in the fornix, more numerous in the outer half, whilst there were none on the lower lid, although the conjunctiva was inflamed. There were three pin-head sized ulcerations between the granules on the upper lid. A slight marginal keratitis was present. The parotid, preauricular and submaxillary glands were enlarged and painful. The opposite side of the face was normal.

A culture showed the xerosis and subtilis bacilli to be present. Treatment consisted of one-fifth of one per cent solution of nitrate of silver with a boric acid lotion. The lids became more edematous and the granulations more prominent. The glandular swelling increased and the pain was marked, with inability to masticate or sleep. Silver nitrate one per cent was now applied to the granulations and antithermoline used externally. This afforded relief so that four days later the swelling was markedly less. About two weeks later there remained but a slight swelling of the parotid gland, the lids and the eye being normal.

Shoemaker concludes that as the granulations disappeared under treatment he considers the usual advice of excision to be unnecessary.

F. C. P.

Corneal Burn by Direct Flame.

TALMEY, MAX, New York (*New York Medical Journal*, May 25, 1907), reports a severe burn of the cornea of a boy five and a half years old caused by an explosion due to feeding alcohol to an apparently extinguished lamp. Four days after the accident the cornea had the color of gray, dense smoke and was very opaque so that the iris and pupil were hidden from view. For the first two weeks the patient could see nothing with his left eye, but at the end of a month he could count fingers at six feet, later at twenty-two feet. A dense macula persisted.

M. L. F.

Two Cases of Keratitis Disciformis.

LANDMAN, OTTO, Toledo, Ohio (*Archives of Ophthalmology*, May, 1907). According to Prof. Fuchs, this disease attacks persons in middle life and appears frequently after slight epithelial defects from trauma and herpes corneae. It is characterized by a faint grey disk, which occupies the central area of the cornea and is separated from the transparent cornea by a more intense border. The surface over this is dull and insensitive. In the course of the disease, which generally lasts several months, small ulcerations frequently appear, and there remains a pretty dense opacity. The disease at the beginning runs a course without irritation, and the patient comes to the doctor on account of visual disturbance. Many cases run this course entirely, while others later develop hyperemia and pain, and at the same time the opacity increases in density. Then follows the history of two cases: in the first there was an absence of irritation, while the second was characterized by great irritation, by ciliary injection and pain, intense photophobia and neuralgia of the supra-orbital and nasal branches of the first division of the trigeminus. The symptoms of the two cases agreed almost in toto with the classical picture of the disease drawn by Prof. Fuchs.

H. G. G.

On Some Forms of Superficial Punctate Keratitis Easily Overlooked.

GRADLE, H., Chicago, Ill. (*Ophthalmology*, April, 1907), describes certain cases, often overlooked, in which the cornea shows under oblique illumination and a magnifying glass, several minute superficial infiltrations, without sharp contours and often very small. The disease causes a great deal of irritation, sometimes considerable pain, with some

ciliary injection. Many times it is the sequel of a subacute conjunctivitis. The sight suffers in proportion to the infiltration in the pupillary area. The treatment consists of nitrate of silver, yellow oxide of mercury or calomel and atropin, if specially indicated, and during the last few years dionin has been beneficial. But, on the whole, treatment is not very effective.

A. F. A.

Keratitis Tuberculosa Relieved by Tuberculin Injections.

ZIEGLER, LEWIS S., Philadelphia (*Ophthalmology*, April, 1907), says that keratitis tuberculosa so closely resembles interstitial keratitis in its clinical manifestation that the differential diagnosis must be made on other than the macroscopic appearances of the eye. The four methods possible are (1) by bacteriological examination, which is generally impossible; (2) by inoculation tests, also often impossible; (3) by signs of systemic involvement, (4) by the reaction of the use of tuberculin. This last gives us not only a reliable systemic sign in the general febrile disturbance, but points unerringly to the infected foci by the evidence of local pain and congestion. A case is reported in some detail illustrating the diagnostic and therapeutic value of small injections of Koch's tuberculin. [Mulford.]

A. F. A.

Pyocyanus Ulcer of the Cornea.

FRIDENBERG, PERCY, New York, (*New York Medical Journal*, June 1, 1907), reports an unusual case of this nature. A girl 16 years of age, in perfect health and with no history of traumatism, developed a sore eye at one of the summer resorts on the New Jersey coast. Two days later examination showed a large, shallow ulcer occupying the lower third of the cornea of the right eye. There was little or no infiltration except along the corneal margin, below, extending upward in a crescentic line to near the horizontal meridian. There was marked chemosis of the conjunctiva, but no discharge whatever. The ulcer was grayish, and covered with a sloughy debris which could be wiped off. There was no pain in the eye, and manipulations showed a certain amount of anesthesia.

In spite of the most energetic treatment the cornea was totally destroyed within the next two or three days and the eye was enucleated at the end of six weeks. Smears taken from

the matter from the cornea revealed nothing, but cultures made from the material demonstrated the bacillus pyocyaneus pure. Inoculation tests corroborated this diagnosis. Fridenberg sums up the interesting features of the case as follows: We have, first, the lack of any determinable injury. Pyocyaneous infection is generally traumatic in origin, the injury having been inflicted with a soiled weapon or with dirt. One would hardly expect to find the *Bacillus pyocyaneus* far removed from crowded habitations, out doors at the sea shore. The bacillus was found in pure culture, and the matter from both ulcer and conjunctival sac was otherwise sterile. In spite of this, there was nothing characteristic in the local conditions. The ulcerated area was a dirty gray. There was no green discoloration whatever which might have led us to suspect the nature of the pathogenic organism. The course of the ulceration was rapid and malignant. There was no perforation; the cornea became entirely shrunken and opaque and then gave way to intra-ocular pressure. After the development of the ulcer there was no pain. The patient did not feel the cauterization with pure tincture of iodine, ordinarily quite painful, and had little or no discomfort, even from the application of the actual cautery.

M. L. F.

Ulceration of the Cornea From the Diplo-Bacillus of Morax-Axenfeld.

MCKEE, H., Montreal, in an interesting article in the *Ophthalmic Record*, April, '07, says that ulcerations of the cornea form one of the most important diseases of the cornea, that diplo-bacillus conjunctivitis may result in ulceration of the cornea, and refers to reports of several cases in literature and seven cases which have come under his own observation in support of this statement.

In the seven cases seen by him the same technique was followed: First, the ulcerated surface was stained with a solution of fluorescein, then some of the pus was removed with a keratome, tubes of serum and agar were inoculated and smear preparations made. In all of these cases the diplo-bacillus of Morax-Axenfeld was found. They were all treated by instillation of drops of sulphate of zinc $\frac{1}{4}$ gr. to the ounce four or five times daily; in the intervals the surface of the cornea and the conjunctival sac were flushed with warm boracic solutions. At night a boracic acid ointment was applied to the

surface of the lids. For dilatation of the pupil a solution of scopolamin HBr. was used. In the opinion of the writer, sulphate of zinc as a therapeutic measure in diplobacillus infection is of undoubted value.

Energetic treatment is necessary from the very beginning, particularly among adult patients, as ulcers of the serpiginous type develop very rapidly. It is well to find out at first what organism is present. Ulcers of the cornea of the serpiginous type may be caused by pneumococcus, streptococcus and diplobacillus, and although each ulcer may clinically present the same picture, it is important to know which of these or what other factors may have to be dealt with. O. W.

Irido-Dialysis From Blow of a BB Shot—Reattachment.

CHARLES, J. W., (*The American Journal of Ophthalmology*, Dec., 1906), reports a case of a thirteen-year-old boy who was struck in the left eye with a BB shot discharged at a distance of two feet. There was a slight wound of the upper lid-margin, abrasion of the conjunctiva and the upper limbus. There was no perforation of the globe. Upward and inward there was an irido-dialysis with hyphemia. The tear was ragged and the pigment layer was turned forward into the anterior chamber. No view of the fundus could be obtained. Treatment consisted of atropine and cocain with a bichloride wash. A collodion dressing was used. Calomel was given internally and rest advised. Three days later, following a strain, a fresh hemorrhage was observed. The patient was placed in a hospital and about a month later the eye was quiet with reattachment of the iris, a portion of which had shrunk to a narrow band.

Moorehead's and Werner's cases are cited.

Charles concludes that peripheral lesions are caused by the direct action of a force upon the ciliary attachment of the iris, the extent depending upon the direction. Also a blow applied to the center of the cornea would be most likely to cause a rupture, first of the sphincter-zone and then of the middle zone of loose stroma and vessels.

He quotes Schafer's opinion why more extensive hemorrhage occurs in iridodialysis than in iridectomy, whose views are that cutting stimulates rather than paralyzes, that the ves-

sels are larger at the base of the iris, and also that when cut they come together more easily than torn ones. F. C. P.

. The Course and Treatment of Simple Cyclitis.

THOMSON, EDGAR S., New York City (*Ophthalmology*, April, 1907), rehearses the beginning and course of the disease with its possible pathology and gives a description of the histological picture. He remarks that "one cannot fail to be struck by the signs of a disordered lymph circulation which come on early and are manifested by the tendency to increased tension, the sluggish ciliary circulation and the slow rate of absorption of the vitreous exudates." Again, "It occurs at times in families with a hereditary predisposition to glaucoma, and it is impossible to avoid the idea that there may be at least some association between the two diseases." Medicinal and operative treatment are discussed. A. F. A.

The Anatomic Changes "Neuritis Proliferativa" (Fuchs), in Three Cases of Ophthalmia Sympathetica.

(Author's Abstract.)

BROWN, E. V. L., Chicago, Ill. (*Archives of Ophthalmology*, March, 1907), contributes an anatomical study of three cases of sympathetic ophthalmia corroborating the recent work of Fuchs. The changes consist of a chronic parenchymatous or interstitial inflammation within the confines of the uvea, which is perhaps best called a "proliferative" or infiltrative uveitis. The affected area of the iris, ciliary body, or chorioid is infiltrated with round cells, epithelioid cells and giant cells which transform it into a granulomatous mass closely resembling a tubercle or gumma, yet without either caseation or necrosis. The granuloma only breaks through the uveal limits into the chambers or vitreous when the process is most extensive. In uncomplicated cases there is no fibrinoplastic exudation upon the surfaces of the uvea. The whole condition is, therefore, in striking contrast with the type of uveitis which does not produce sympathetic inflammation, that is, with the ordinary traumatic irido-cyclitis; here there is a great amount of cellular and fibrinous exudation upon the surfaces of the tunics, matting together the iris and lens and the ciliary processes. Yet mixed infection is the rule and both processes are usually present.

Histologically, Brown emphasizes the fact that between these two forms of inflammation the differential diagnosis *can* be made and made *only* by the presence or absence of proliferated epithelioid cells; round cell infiltration is common to both forms; giant cells are inconstant and are only transformed epithelioid cells. In the sympathetic form the epithelioid cells come from the ordinary fixed connective tissue cells of the uvea, from the epithelioid cells normally present between the elastic lamellae, from the endothelium and perithelium of vessels and from the pigment epithelium. When the process is at its height the epithelioid cell areas are seen even by low power as irregular, clear staining clusters among the heavy staining round cells in the stroma. Later these cells become transformed into connective tissue fibers closely resembling sclera; at this time it is difficult to call the process a specific one; in the very earliest stages the new epithelioid cells can only be found among the round cells by the use of the oil immersion, but they are then unmistakable.

Brown finds that epithelioid cell proliferation has been described in 21 eyes which have caused sympathetic inflammation aside from the series of 24 in which Fuchs was able to make the clinical diagnosis solely by the study of stained specimens from the enucleated eye.

Two drawings accompany the text.

Neuritis of the Intracranial Portion of the Optic Nerve.

GRADLE, H., Chicago. (*Archives of Ophthalmology*, March, 1907)—The writer reports three cases in which the transient failure of sight can best be explained by the assumption that a diffuse neuritis involved only the intracranial portion of the optic nerve. The clinical characteristics are consistent with our knowledge of the topography of the fibers of the intracranial trunk. Sudden diminution of sight, without a central scotoma and with a nearly normal field, but with a decided impairment or abolition of color perception throughout the field, a tendency towards recovery, but with a possible end in incomplete atrophy, and with an absence of all other symptoms except an initial headache, gives the clinical picture of intracranial optic neuritis. The most probable cause of the lesion is syphilis. While uncomplicated intracranial neuritis is comparatively rare, the writer believes that a mild degree of

inflammation of the optic nerves within the skull is not an infrequent complication of basal syphilitic lesions which involve some of the motor nerves of the eyes. He has seen at least six instances in which various ocular palsies, due to syphilis, were accompanied by dimness of sight in one or both eyes without fundus changes. Full recovery occurred in all under specific treatment. Then follows an illustrative case of this form of optic neuritis. The records of the five other instances of ocular pareses with slight dimness of vision unexplained by ophthalmoscopic findings, differ only in the degree of impairment. In three of them only one optic nerve was involved, in the others both eyes were slightly impaired but to an unequal degree.

H. G. G.

Hemorrhages Within the Orbit With Report of a Case of Spontaneous Origin.

FOOTE, F. T., (*Ophthalmic Record*, April, '07), reports a case of hemorrhage within the orbit of spontaneous origin. The patient, a woman, aged 42 years, healthy and well nourished, had dimness of vision in the left eye and was unable to distinguish objects beneath the level of the head when looking forward. For more than a year there had been a dull pain in the left brow which was aggravated by lying on the left side. One night she was suddenly awakened from a sound sleep by an excruciating pain in the left brow and eye; the brow and left side of the face were much swollen and the eyeball protruded. The lids were so suffused with blood that they had to be forcibly separated. The eyeball was drawn upward and outward, and movement in all directions was impaired. She was quite blind. Swelling of the lids subsided under hot poultices. A large suffusion of blood showed beneath the palpebral conjunctiva of the lower lid. Vision gradually returned as the swelling of the lids subsided, but objects above the level of the head could not be seen well with the left eye, which did not regain its normal position for over two weeks. She was given potassium iodide gr. xx three times daily and adrenalin chloride 1:1,000 was frequently applied to the conjunctiva.

In the opinion of the writer, this hemorrhage was caused by a spontaneous rupture of the superior branch of the ophthalmic vein.

O. W.

An Orbital Tumor of Ten Years' Standing.

LEENHEER, C. A., Chicago (*Ophthalmic Record*, May, '07), describes a case of orbital tumor, endothelioma, of ten years' standing. The patient, a woman, aged 34, consulted him in September, '94. She had a protrusion of the left eye which had been noticed ten years before.

When seen by Leenheer vision in the right eye was 20/20. The left eye was blind, and protruded $\frac{3}{4}$ of an inch beyond the orbit, the lids covering the cornea. There was convergent strabismus with loss of all muscle motion except that of the external rectus. Blood vessels, lids and globe were enlarged and engorged. The cornea and media were clear, the pupil was larger than in the right eye, round and regular. The disk was elevated and best seen with a +4D. The vessels were engorged and twisted, especially the veins, the tension was normal. No distinct mass was perceptible in the orbit, the structures were soft and easily outlined.

Kroenlein's operation was performed; a tumor, firm, irregular, filled the muscle funnel and was removed piecemeal. One piece had taken the shape of the posterior portion of the muscle funnel and was removed whole. The tumor weighed 8.53 grams. The microscopical examination is given in the illustration. One year later there was evidence of a return of the tumor. O. W.

Carcinoma of the Cornea.

DUDLEY, W. H., Los Angeles (*Ophthalmic Record*, May, '07), reports a case of carcinoma of the cornea in a male patient 83 years old, who had had his eye injured fifteen years before by a kick from a horse, loss of vision being the only trouble that immediately resulted therefrom.

He had a vascularized macula of the cornea extending from the inferior quadrant of the limbus, upward and inward and covering the pupil. The unaffected portions of the eye were normal. The scar tissue included the limbus. About a year after the patient was first seen an elevated papillomatoid growth took the place of the vascular condition. A portion of this was removed and found to be papillomatous. This growth recurred twice, each time a portion being removed; it continued to increase in size, became painful and ulcerated and bled.

It was removed by inserting a pair of scissors between it

and the face, dividing the eye 7 mm. in front of the posterior pole, the posterior portion being removed as in an ordinary enucleation. It had extended backward around the sclera, enclosing more than one-half the globe though attached to the orbital tissues, and had drawn the eye forward $\frac{1}{2}$ an inch. There were adhesions of the tumor to the cornea and sclera.

The tumor was a carcinoma with, apparently, some acute inflammatory changes in the region of the junction of the tumor and the cornea. The fibrous tissue of the growth had extended into the fibrous tissue of the cornea near the limbus. Recovery was prompt. The patient lived two years after the operation. There was no return of the tumor. O. W.

A Case of Epithelioma of the Chorioid.

WEEKS, J. E., New York (*Ophthalmic Record*, April, '07), reports a case of epithelioma of the chorioid. The patient, a woman, 62 years old, was first seen in October, 1906. Several months previously the left eye had become red and painful with pain in the left side of the head; she was treated for iritis. When seen by Weeks, there was a very slight injection of the ocular conjunctiva of the left eye, the anterior chamber was very shallow, the pupil was of moderate size and irregular from posterior synechiae, the lens was completely opaque, the tension slightly above normal. There was a sensation of fulness in the eye and a dull pain in the left temple. The injection of the ocular conjunctiva was greater in the outer quadrant.

Transillumination with the Sachs lamp showed that the pupil transmitted light when light entered the globe from all parts, except in the lower quadrant. With the light on an area extending from the ciliary zone to the equator of the globe and about 1 cm. in the equatorial direction the pupil was dark. Vision equaled preception of light. Projection was faulty above and to the nasal side.

Enucleation was performed. Transillumination of the globe after removal revealed the exact site of the mass within, also a meridional line on the sclera over the middle of the mass. Examination showed that the growth had involved the outer inferior anterior portion of the chorioid and ciliary body in this part, pressing against the crystalline lens and projecting into the vitreous as far as the median line. The growth had ap-

parently developed from the layer of large vessels of the choroid. About $\frac{3}{4}$ of the mass consisted of ordinary round and spindle sarcoma cells with a slight infiltration of leucocytes. The remainder of the cellular mass was composed of large, irregular, spherical cells which contained oval nuclei with nucleoli fairly uniform in size. All of the nuclei were placed near the periphery, the greater number of which were mononuclear and almost uniform in size. The arrangement of the cell masses gave the appearance of the so-called alveolar sarcomata.

O. W.

Glioma Retinae—Complete Report of an Extensive Case.

Clinical history by RADCLIFFE, McCLUNEY.

Histologic study by GOLDBERG, HAROLD G., (*Archives of Ophthalmology*, March, 1907).

After several accidents a female child, aged two years, reported at the Wills Hospital for treatment, the mother having observed a peculiar amber tint in the left eye when the child moved her head in certain positions. After an attack of measles this spot grew rapidly until it appeared to fill the eye ball. The ophthalmoscope showed a whitish, somewhat prominent spot on the fundus to the temporal side of the optic nerve. Glioma was suggested and an operation advised, but refused. After several visits to the hospital an operation being urged each time, the mother finally consented. At this time examination showed a marked exophthalmus, with a subconjunctival hemorrhage covering the inner half of the eye ball, the left pupil fully dilated and immobile, the anterior chamber shallow, the tension plus 2, the iris slightly discolored, the aqueous turbid, the globe slightly larger than normal, while a yellowish mass could be seen through the pupil to fill the entire globe, the mobility of which was limited in all directions; the general health was poor. The eye ball was enucleated, and as the orbit was found to be involved it was completely eviscerated. Less than a month later the patient died, and an autopsy was performed. Specimens were removed from the brain, spinal cord, posterior segment of the unaffected eye ball with the optic nerve, liver, kidneys, spleen, heart and lungs. The supposedly sound eye ball, the liver, spinal cord and brain were all found to be involved in the growth, which proved on examination after treatment by various special stains to be a

glioma. This growth apparently affected the left eye primarily and ultimately involved the other organs named above by direct extension and metastasis. A microscopic examination proved that all the organs contained the same character of cells as the primary growth, viz., round and oval cells (medium sized) with a small amount of protoplasm and relatively large, granular, deeply staining nuclei, lying within a fine reticulum which stained faintly. A number of pale granular cells with relatively more protoplasm and faintly staining nuclei resembling in form and size those just described. In the eye ball perivascular rosette formations were found, and in the optic nerve were elongated cells, their apices in contact with the degenerated lining of the vessel; the periphery of the cell, which corresponded to the center of the lumen, bore a granular nucleus resembling the cells described above; the peripheral extremities of these cells were united by a thin homogenous line which practically formed the lumen of the vessel, because contained within this line was blood; this line and the lines separating the cells did not take the special stains and showed by contrast against the body of the cell; from without, in, then, was seen the adventitia, the thickened media, the intima, the degenerated endothelium and the layer of cells and blood. Rosettes could not be found in the nerve proper or anything resembling them. A specimen of the liver tissue was submitted to a general pathologist whose report corroborated that of the writer's .

H. G. G.

A Contribution to the Subject of the Causation of Glaucoma by Intra-ocular Tumors.

PUSEY, BROWN, Chicago (*Archives of Ophthalmology*, March, 1907). The writer describes a case of glaucoma in which at the root of the iris was a dark brown deposit of a pyramidal shape. The diagnosis of tumor was made and enucleation performed. A microscopic examination showed a deeply pigmented growth which had involved the pectinate ligament, the posterior layers of the cornea, the posterior layers of the sclera and the lymph spaces around the blood vessels. The sinus venosis sclerae was patent and the vessels of the sinus were everywhere invaded by the pigmented cells. The perivascular lymph spaces of other vessels in the region of the ciliary bodies were infiltrated with the cells. The iris was invaded with pigmented tumor cells at its base. The tumor

reached the anterior chamber by its growth along the supra-chorioid space pushing the chorioid, ciliary body and retina inward. It thus projected into the chamber. The nerve head was moderately cupped. The chorioid away from the region of the tumor was normal, but in the region of the tumor, far forward near the ciliary body, the growth had broken through. The tumor was composed histologically of small spindle and round cells, in some regions it was highly pigmented, while in others there was no pigment. A few cells were found which showed karyokinetic figures. Clinically and pathologically this was a case of glaucoma secondary to an intra-ocular sarcoma, which, as the writer states, is very rare, in which the explanation of the cause of the increased tension is as follows. The pigmented cells which had their origin in the tumor found their way into the anterior chamber, and thence into the spaces of Fontana, where they acted as occluding particles, interfered with the exit of fluid from the eye, and thereby caused glaucoma.

H. G. G.

The Treatment of Glaucoma Simplex.

CHENEY, FREDERICK E., Boston, Mass. (*Ophthalmology*, April, 1907), contributes a timely and thoughtful paper on the advisability of various expedients in the treatment of glaucoma simplex and the difficulty of deciding in the various conditions exactly what course to pursue. Dr. Cheney maintains that a glaucomatous cup is sufficient proof that the optic disk is subjected to greater pressure than it is capable of resisting, whether palpation shows apparent increased tension or not and that in most cases iridectomy seems the rational method for removing that pressure. The value of myotics and sympathectomy are discussed. The modification of treatment to suit the peculiar conditions of each case are carefully considered. Several case histories are included in the paper. In the discussion of the paper by Dr. Posey, the advantage of myotics is urged.

A. F. A.

Acute Rise of Intra-ocular Tension Following a Single Subconjunctival Injection of a Solution of Cyanid of Mercury.

DE SCHWEINITZ, G. E., (*Ophthalmic Record*, April, '07), reports a case of intra-ocular tension following a subconjunctival injection of a solution of mercury. The patient, a man, 29 years old, had a marked uveitis of the left eye which had be-

gun with a conjunctival hemorrhage, and later a hemorrhage into the vitreous had occurred. His general condition was good. Vision of the left eye, after correction of 1 D. of hyperopic astigmatism with its axis 180 was normal, vision in the left eye was 6/60, tension below normal, anterior chamber deep, iris discolored and its pupillary area thickened and elevated. There was a fine punctate keratitis, the vitreous was filled with thick opacities through which the fundus showed dimly, revealing a disk with blurred margins and very dark tortuous veins. There was a marked contraction of the visual field on the upper and temporal sides. Scopolamin mydriasis, mercurial inunctions followed by iodide of potassium and pilocarpine diaphoresis gave very satisfactory results, and vision rose to 6/20.

During the treatment ten subconjunctival injections of physiologic solution were given with apparent improvement. After the treatment had been continued for five weeks a subconjunctival injection of ten minims of cyanide of mercury 1-1000 in the upper and outer portion of the bulbar conjunctiva between the superior and external rectus was given. Within a few minutes there was severe pain and in half an hour intense injection of the eye ball, marked steaminess of the cornea obscuring the underlying tissue, decided rise in the ocular tension and reduction of visual acuity to hand movements. Hot compresses and instillations of a solution of eserine 1 gr. to the oz. with adrenalin 1-10000 afforded some relief. The attack lasted five hours, treatment being continued, but the adrenalin was omitted and pilocarpin, 2 grs. to the oz. was substituted for the eserine. Next day the only traces of the disturbance were a small patch of congestion over the area of the injection and a tenderness of the globe. O. W.

Prophylaxis of Contagious Diseases of the Eye.

SKRAINKA, PHILIP (*The American Journal of Ophthalmology*, April, 1907), states that the prevention of contagious eye diseases is an important issue of the present day. Isolation has been proven to be the most efficient means, especially if carried out properly. People should be enlightened in regard to the seriousness of the conditions. Publicity is encouraged.

Skrainka thinks it should be compulsory for the patient to present a report from his physician and for the physician to

acquaint the Board of Health with the presence of any contagious disease, which, if present, should compel the patient to be isolated.

He states that in some of the more modern schools, the roller towel, etc., are still in existence.

A plan for a contagious eye hospital is presented.

F. C. P.

The Accessory Sinuses of the Nose From an Ophthalmological Standpoint.

POSEY, WILLIAM CAMPBELL, Philadelphia (*New York Medical Journal*, March 2, 1907), says that sphenoiditis and ethmoiditis may excite retrobulbar inflammation of the optic nerve of varying degrees of intensity, and paresis and palsies of the ocular muscles. That displacement of the globe and orbital abscess are occasioned by sinusitis is a matter of almost weekly experience, and despite the warning which was given of the ease with which mistakes in diagnosis may be made in this class of cases, abscesses which pointed in the lacrimal region and which were apparently simple mucocoeles of the lacrimal sac, have proved at the operation to have originated in the lacrimo-ethmoidal cells and to be instances of prelacrimal abscesses. Edema of the lids has shown itself to be a frequent index of the existence of sinus disease in many instances, and in his opinion the significance of this sign cannot be overestimated.

The conjunctiva has been turgid and studded with follicles in other cases, where the nasal disease seemed to have involved the nasopharynx rather than the sinuses; dendriform ulcer of the cornea appeared to be dependent upon an ethmoiditis in one instance, and change in the refraction of the eye, occasioned either directly by the pressure exerted upon the globe by the wall of a dilated sinus, or perhaps indirectly as a consequence of congestion and spasm of the ciliary muscle, has been observed not very infrequently.

He has not, however, been able to satisfy himself that ocular conditions other than these were actually dependent upon a sinusitis. One case of plastic uveitis in a young man, who was suffering at the same time from an acute purulent ethmoiditis did seem to give testimony to the truth of the statement of Ziem, Fromaget, Fish and others that uveitis may be due to

sinusitis, but repeated examinations of the nasal conditions by competent rhinologists in many other cases of iritis and chorioiditis failed to discover further evidence to substantiate the assertions of these observers. And this seems strange, for if the sinuses and orbits are exposed by dissection, and the enormous extent of the mucous membrane which lines the nasal cavity is surveyed, and account taken of the intimate relationship which this highly vascular tissue has by means of blood-vessels, lymphatics and nerves with the tissues of the eye, it does not appear extraordinary that disease of this mucous membrane should not excite disturbances in the eye. There must be some controlling mechanism, some peculiar arrangement of the anatomy of the parts of which we are as yet unaware, which protects the eye from participating in these inflammatory conditions, just as there is some subtle mechanism which controls and regulates the intra-ocular circulation, and makes it more or less independent of that of the general system.

The claim is made by certain rhinologists that while it is true that many of their patients who have sinusitis complain in a vague way of pain about the eye although signs of disease seem to be absent. These vague symptoms may refer to definite ocular lesions which the ophthalmologist would have no difficulty in discovering, and it is of the greatest importance that the intra-ocular condition should be watched by the ophthalmologist. The author thinks it better for a rhinologist and an ophthalmologist to work together on a case, though he acknowledges that the ideal observer would be one who combined the two specialties in his own person.

While he is ready to admit that the refraction of the eye may be altered by pressure upon its walls by an exudate or by a distended sinus, or by a change in the lens consequent upon a spasm of the ciliary body due to nervous or lymphatic influences which may possibly arise in the nose, he thinks that the importance of the nasal condition in refraction errors has been exaggerated.

M. L. F.

The Value of Routine Use of X-ray in Orbital Affections Arising From Accessory Sinus Disease.

LANGWORTHY, H. G. (*The American Journal of Ophthalmology*, April, 1907), is of the opinion that X-ray examinations should be made in all cases of sinus trouble as it has been

shown to be very important. The antero-posterior view as a rule, gives the best results. In a sinus full of pus, the diseased side shows up as more opaque than the sound side and at times may be obliterated. It would be an error to consider such examinations infallible.

In conclusion Langworthy states that the Killian operation is the best procedure when there is an orbital tumor or exophthalmos, the result of extension from the frontal or ethmoidal region. He describes the operation and states that the subject of X-ray work in special fields is most interesting and needs to be developed.

F. C. P.

A Case of Bilateral, Painless Dilatation of the Frontal Sinuses.

DUNN JOHN, Richmond, Va. (*Archives of Ophthalmology*, March, 1907). The year following an attack of frontal sinusitis which spontaneously evacuated itself through the right nostril, the patient, a man aged 23, noticed that his "forehead was swelling," and this swelling gradually increased until the following condition described by the writer was brought about. There was no accompanying pain, nothing in fact but the progressive bulging of the forehead. The nose was normal in every way. The patient was put under chloroform and an exploratory incision made over the most prominent part of the protrusion, when the external bony plate of both sinuses was found to be of a thickness little greater than that of a thumb nail. Immediately beneath the bone lay a grayish white membrane which on pressure burst like a dried bladder filled with air. The writer believes the case to be that of a complete bilateral atrophy of the mucous membrane of the frontal sinuses.

H. G. G.

A Case of Eye Strain Mistaken for Appendicitis and Cholelithiasis.

ALGER, ELLICE M., New York (*New York Medical Journal*, June 8, 1907), reports a case in which symptoms of abdominal pain in a young man 19 years of age caused eminent surgeons to make the diagnosis of appendicitis or cholelithiasis, but disappeared after he had been properly fitted with glasses. Later he lost his glasses and applied to an optician who supplied him with a pair, but his symptoms returned. Then he consulted Dr. Alger, who fitted him with glasses again and had had no recurrence of his trouble up to the time of writing, about six months.

M. L. F.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(Great Britain and the English Colonies.)

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Treatment of Obstruction of the Lacrimal Canal.

PARSONS, J. HERBERT (*British Medical Journal*, February 23d, 1907), contributes a lecture on the "Treatment of Obstruction of the Lacrimal Canal," delivered at the Royal London Ophthalmic Hospital, in which he treats of, first briefly the symptoms and pathology. He then follows with an analysis of the causes of the frequent failures and presents his idea of the best method of treatment under two heads, namely, Syringing and Extirpation, and concludes by giving special consideration to treatment in young children.

The etiology he considers to be generally an extension of inflammation from the inferior meatus. In rare cases the lacrimal sac is primarily inflamed. In many cases there results intractable conjunctivitis which may have been associated with the preceding rhinitis and a bacillus may be found in the nasal discharge similar to the Morax-Axenfeld. The inflammation of the canal results in engorgement of the venus plexus of the sac and duct preventing free draining with a resulting accumulation of fluid in the sac which becomes a culture medium for

any infection that occurs. This brings about increased mucous secretion and mucous inflammation and the formation of pus. We now have Dacryocystitis. Pressure may empty the sac into the nose but more commonly it regurgitates into the conjunctival sac.

The muco-pus almost invariably contains pneumococci, and in addition may have present other pathogenic organisms.

The pneumococci of dacryocystitis are frequently extremely virulent and ulcers of the sergipenous variety are common. In case of wounds, particularly perforating wounds, panophthalmitis may result, hence the necessity of postponing all ocular operation in the presence of dacryocystitis. Acute attacks may supervene with the formation of a lacrimal abscess. These dangers, the author thinks, necessitate an immediate and permanent cure.

He considers the method of treatment as generally practiced by probes, only to condemn it. The treatment will result in new tissue which will contract and reobliterate the duct necessitating repetition of the treatment indefinitely, and each time with larger probes, a tedious, painful and unsatisfactory process. Syringing will in the majority of cases, if properly carried out, effect a complete cure if *the case has never been treated with probes*.

Syringing must be thorough and be persevered in. It is most successful in early cases, and where there is only epiphora. In doing this, the lower punctum is dilated and the sac washed thoroughly with boric or saline solution. If the fluid does not pass down into the nose in a week, zinc sulphate, 1 or 2 grains to the ounce, is freely used after the cleansing. This is followed by protargol, 10 to 15 grains to the ounce, and the excess squeezed out.

Once a free passage has been secured, the syringe is lessened in frequency until a cure is effected.

Syringing is unsuccessful unless carried out thoroughly, and in cases that have been previously probed, or in cases of long standing.

In all such cases excision of the lacrimal sac is indicated.

This does not lead to epiphora as the normal secretion is only sufficient for moistening the eye. In irritation of the conjunctiva or emotional or other reflexes epiphora will appear.

The epiphora of dacryocystitis is due to the associated conjunctivitis from the irritation of the discharge from the sac.

After removal of the sac, the conjunctivitis must be cured by treatment, when the epiphora will cease. He has had no case where subsequent removal of a part of the gland was necessary. In operating, the sac must be completely removed. The upper portion of the sac extending above the lacus lacrimalis is the part most often forgotten and consequently incompletely removed, especially where the internal palpebral ligament is not divided.

In suppuration cases, complete removal is much more difficult, but it must be done thoroughly. Bleeding during the operation may usually be controlled by the retractors and by the use of adrenalin.

The instruments used are small scalpel, Mullers and Axenfeld's retractors, probe pointed tenotomy scissors, small Volkmann's spoon, periosteal elevator, needles and silk.

He operates under general anesthesia. The palpebral ligament is put upon the stretch and a curved incision made from 5 mm. within and a little above the canthus down and outward along the lower orbital margin. The internal ligament is divided, and the sac cut down on and dissected out with scissors leaving the duct till the last. This is now freed and cut off as low down as possible, after which the duct is curetted, the skin is closed and dressed. Union by first intention is the rule.

If there is regurgitation after a week or two, some portion of the sac has been left and it must be removed before a cure can be effected. The scar is inconspicuous.

This operation should be previously done in all cases of cataract complicated by mucocele, in chronic glaucoma, and other operations. In acute glaucoma, the canaliculi may be ligatured or sealed with cautery.

In children the disease is usually easily cured, as it results from imperfect freeing of the lower end of the duct of epithelial debris at the latter end of development.

The mother should squeeze out the sac daily and use a simple conjunctival lotion. Failing in this, a small probe may be passed once under anesthesia, no force being used, and the sac syringed out. If this fails, extirpation is necessary. In chil-

dren this is often difficult, especially where caries and extension to the ethmoid sinuses has occurred, as is frequent in syphilitic cases.

W. R. P.

Lacrimal Sac in the Economy of Vision.

EVANS, J. JAMESON, (*Brit. Med. Jour.*, Feb. 23, '07), gives a consideration of the "Lacrimal Sac in the Economy of Vision" in which he treats of the physiology and pathology of lacrimation, and gives a consideration of excision of the sac as the only effective treatment, concluding with a list of indications for excision.

He says tears are unnecessary for good vision, and that the sac and duct are not essential to the visual function. Congenital absence of the lacrimal gland is harmless, as is also extirpation.

The epiphora seen in dacryocystitis is due to the reflex irritation and associated conjunctivitis.

Atony of the sac is a result of the chronic inflammation and the tears no longer are forced into the duct even if it is rendered patent below by treatment. This the author thinks is the main cause of failure in the treatment.

The danger of not effecting a complete cure lies in the infective nature of the retained discharge. Various pathogenic bacteria, notably the pneumococcus, are invariably present. Hypopyon ulcer commonly results. In 85% of such cases vision is reduced too low for binocular vision.

Ninety-five per cent of Hypopyon ulcers results from the pneumococcus. When acute phlegmonous inflammation of the sac occurs streptococci and bacterium coli, etc., may be present. The dangers of operations on such eyes are emphasized. They should be postponed until the dacryocystitis is entirely cured or the canaliculi sealed.

The usual method of treatment by probing being so tedious and unsatisfactory, extirpation should be done as the only effective mode of treatment; excision is infinitely preferable to obliteration by cautery.

The incision should extend from the lower border of the internal palpebral ligament at its insertion into the bone. downwards along the border of the orbit for 3 c. m. It should divide the tissue down to the bone where the sac is exposed by reflecting the soft tissues to the side. It may be recognized

by its grayish glisteninig appearance. It should be separated at the sides and above from the bone, care being taken not to sever the palpebral ligament when the upper part has been freed, it is separated below as deep into the duct as possible and divided, after which the duct is curetted or cauterized. The wound is closed with sutures which may usually be removed the third or fourth day as healing is by first intention.

The scar is insignificant. Epiphora is usually absent or not troublesome if the associated conjunctivitis is cured by treatment. The author has never found it necessary to excise the gland, but should epiphora prove intractable, accessory lacrimal and mucous glands will supply all necessary moisture.

The indications for excision are stated to be as follows:

1. "Cases of dacryocystitis which have resisted conservative treatment by probing, etc., for three months or more. The radical treatment is more urgently called for where probing causes acute suffering, when the patient has already suffered from corneal complications, and where there is disease of the bony walls of the lacrimal canal.

2. Cases where the dacryocystitis is bilateral and the patient has already lost one eye from hypopyon ulcer, the removal of the sac on the side of the healthy eye is a matter of extreme economic necessity. At the present time insurance companies are loth to insure a workman who has lost one eye, but if the danger of a double dacryocystitis became common knowledge, I think all such cases would be absolutely refused.

3. As a preliminary to operations on the eyeball in cases of dacryocystitis. Here again the necessity for the operation becomes absolute if the fellow eye has already been lost through post-operative infection from the lacrimal sac.

4. Diseases of the sac which endanger general health—for example, tubercle, malignant growths, etc.

5. Lacrimal fistula."

W. R. P.

Eye and Ear Symptoms in Cerebro-Spinal Meningitis.

SHAW, CECIL (*Medical Press*, February 20th, 1907), presents a short article on the "Eye and Ear Symptoms. in Cerebro-Spinal Meningitis" and gives statistics and histories of two illustrative cases.

He gives as eye symptoms:

Conjunctivitis seen generally the first day or two in 60% of cases. Photophobia often present in early stages. Cornea frequently steamy and infiltrated, often clearing up but sometimes ulcerating. Pupils contracted, dilated or unequal. Iritis, chorioiditis or optic neuritis together or separately, the two latter being serious as regards prognosis for sight. Optic neuritis not so frequent as in tubercular meningitis. Occasional orbital cellulitis. Paralysis of third, fourth and sixth not uncommon.

The ear symptoms are often, marked deafness appearing in the first or second week from inflammatory changes in the nucleus, nerve trunk or labyrinth. The deafness is usually complete and permanent. Suppurative disease with mastoid disease may, according to Von Ziemssen appear before the 25th day. 12 to 14% of cases of deafness in institutions result according to quoted statistics, from cerebro-spinal meningitis.

At Oberfrank, Germany, with a population of 55,000, 58 cases were admitted in the institution for deaf and dumb as a result of deafness sequent to meningitis. In several epidemics, the majority of cases have presented this sequela. W. R. P.

Retinitis Pigmentosa and Allied Diseases.

NETTLESHIP, E. (*Royal London Ophthalmic Hospital Reports*, March, 1907). The diseases noticed are retinitis pigmentosa (including the so-called retinitis pigmentosa sine pigmento), retinitis punctata albescens, atrophica gyrata chorioideae et retinae and congenital stationary night-blindness without changes. His study embraces a series of nearly one thousand families, containing seventeen hundred persons affected with retinitis pigmentosa and about fifty families, containing nearly three hundred individuals affected with some one of the other three diseases. He excludes all cases where syphilis, acquired or inherited, seemed probable, and considers only the permanent congenital type. No one doubts it is often hereditary, but among those who maintain that consanguinity often occurs, different views are taken as to its significance. Without doubt the victims of this disease are very frequently the children of blood relations, usually first cousins but sometimes more remote and occasionally much nearer. In the families mentioned he finds heredity without consanguinity in 23.5 per cent, consanguinity without heredity in 23 per cent, and heredity com-

combined with consanguinity in 3 to 4 per cent, while in one-half the cases the notes give no information about these factors.

He defines the different modes of transmission as follows:

- (1) Continuous direct inheritance;
- (2) Discontinuous or indirect inheritance;
- (3) Collateral or lateral; affection of brothers and sisters only;
- (4) Double or reinforced—derived through both parents;
- (5) Different manifestations of heredity or transmission in various generations or individuals of a family.

Under continuous heredity he reports:

One case of seven generations, including thirty-eight patients with retinitis pigmentosa.

Two cases of five generations, one includes twenty-nine, and the other seven patients.

Two cases of four generations,

And seven cases of three generations.

Of these in two successive generations he illustrates only some different modes of this degree of inheritance. He reports nine cases in which the inheritance was discontinuous and one in which the continuous and discontinuous inheritance were side by side. In none of these does the disease skip more than two generations in the direct line, and even then they were side cases of the same disease or an equivalent. In the next group of seven cases at least two and sometimes three generations were free, in fact there was no proof of inheritance at all. In all these twenty-eight cases or series there was no blood relationship between the parents or earlier ascendants.

In 3 or 4 per cent of the families (thirty-two in all) both heredity and consanguinity were found. They fall into two groups of continuous and discontinuous descent combined in various ways with consanguinity. The data for deciding whether consanguinity can produce retinitis pigmentosa or not yet exist. Consanguinity is but an expression of heredity acting through both parents, and if both husband and wife are entirely free from taint they are no more likely to have children with retinitis pigmentosa if they are akin by blood than if they are not, but it is important that larger genealogies of retinitis pigmentosa should be obtained.

He concludes that heredity is a potent cause of retinitis pigmentosa and that the descent, though sometimes continuous

from generation to generation, either directly from parent to child or indirectly from uncle or aunt to nephew or niece, often shows itself intermittently, and may be hidden for as many as three generations. But of parental consanguinity we cannot affirm more than that it often precedes the appearance of the disease and although we are not yet able to disprove its specific influence, all the indirect evidence points to marriage of blood-relations being harmful only when both husband and wife are members of a tainted stock.

In regard to sex, of 1381 cases in which sex is mentioned, he finds the proportion nearly three males to two females. The disease is, however, oftener transmitted by the affected women than by the affected men. The sex of the transmitting affected parent has no influence in the sex incidence of the disease in the children. (To be continued.)

W. E. B.

Examples of Hereditary Primary Glaucoma.

LAWFORD, J. B. (*Royal London Ophthalmic Hospital Reports*, March, 1907). Von Graefe thought the influence of inheritance seemed to predominate in typical inflammatory glaucoma, while the records since then seem to show that the hereditary glaucoma is more likely to assume the chronic form. Lawford cites five of his own and gives others from literature, and inclines to the following conclusions:

(1) That "anticipation" is usually a marked feature, meaning that the disease appears earlier in the subsequent generations than in the earlier ones who had it.

(2) That the disease usually, but by no means always, appears in the chronic form.

(3) That the liability to transmission by the two sexes is roughly equal.

(4) That the male sex shows a slightly greater liability to inheritance.

W. E. B.

Pathology of Macular Holes.

COATS, GEORGE (*Royal London Ophthalmic Hospital Reports*, March, 1907), reviews the literature of the subject and reports four cases of his own. His conclusions are: That macular holes are produced by an edema of the retina at the posterior pole. The edema may not be confined to the region of the fovea, but the appearance of a hole will only be produced if there is a defect at least of the inner layers of the retina.

Possibly for the completely typical picture, without membranes or shreds, a total defect of all the layers of the retina is necessary, and that such a complete defect may arise from retinal edema is proved by one of his cases cited. The edema may result from a contusion; or it may arise from toxins in the vitreous, the result of iridocyclitis; or from retinal vascular disease.

Rupture of the retina at the time of injury is not the cause of macular holes. This is proved (1) by those instances which occur without an injury in cases of iridocyclitis, chorioidoretinitis, retinal vascular disease, albuminuric retinitis, etc.; (2) by those cases in which diffuse opacity of the retina without hole has been observed after a contusion, and in which a hole has subsequently developed; (3) by a case which he reports, in which such a rupture had occurred, but in which the measurements and appearances could not be brought into line with the clinical picture of macular hole.

W. E. B.

Study of the Ciliary Epithellum after Puncture of the Anterior Chamber.

•HENDERSON, E. E., and LANE-CLAYPON, JANET E. (*Royal London Ophthalmic Hospital Reports*, March, 1907). It is now generally admitted that the source of the intra-ocular fluid is the ciliary body and its processes, and the structure of this part of the eyeball refers the question at once to the ciliary epithelium. After experimental study upon the eyes of albino rabbits the writers conclude that normally when the intra-ocular pressure is maintained, the process of production of the intra-ocular fluid is probably one of infiltration. Rapid changes in pressure bring about disintegration of the epithelial cells, leading to changes in the fluid produced and causing coagulation. They are inclined to regard the changes observed in the cells as indicative rather of diminished function and disintegration, than of increased function and secretion.

Head-Nodding and Nystagmus.

HANCOCK, ILBERT (*Royal London Ophthalmic Hospital Reports*, March, 1907). We meet with two distinct groups of cases in which associated movements of the head and eyes are the prominent, if not the only, symptoms of disease.

(1) Cases of so-called "spasmus nutans," which is generally described as a functional disorder of infancy. It is char-

acterized by rhythmical movements of the head which are almost invariably associated with nystagmus.

(2) Cases of congenital head-nodding and nystagmus which may occur in several members of the same family, the symptoms, as a rule persisting throughout life. Under spasmus nutans he discusses the more important predisposing and exciting causes upon which stress has been laid by various authors: as rickets, dentition, traumatism, neuropathic history, gastro-intestinal irritation and living in dark rooms; and excludes them all. In regard to any relationship between the movements of the head and eyes, he finds various objections to the compensatory view. The most generally accepted view is that of Haddon, who believed that the head-nodding and nystagmus pointed to instability of the motor centres above the nuclei in the spinal cord and fourth ventricle, and he attributed the disorder to a functional or other disturbance of the cerebral cortex. The child has acquired certain voluntary movements of the head and eyeballs, but these have not, at so early an age, become thoroughly organized and fixed in the psychomotor area of the brain, a dissolution taking place because of the inability of the strained cortical centers to stand the work to which they have been too early subjected.

Congenital head-nodding and nystagmus is an entirely distinct group. The prominent features of this group as compared with the cases of spasmus nutans are:

(1) The symptoms date from birth, whereas in spasmus nutans they have never been known to occur before the sixth week, the average time of life for the onset being the sixth to seventh month.

(2) The symptoms persist throughout life, whereas cases of spasmus nutans invariably recover.

(3) In all the cases that have come under my observation, there has been lateral nystagmus, with rotatory nodding, suggesting that in these cases the head movements may possibly be compensatory to those of the eyes. In spasmus nutans there is no such relationship between the type of nodding and type of nystagmus.

(4) They are all very amblyopic, whereas cases which have recovered from spasmus nutans have been found, when old enough to have their vision tested, to have normal sight.

W. E. B.

The Clinical Features, Bacteriology, and Treatment of Acute Ophthalmia in the East with an Analysis of 5,700 Cases.

BÜTLER, T. HARRISON (*Royal London Ophthalmic Hospital Reports*, March, 1907). By ophthalmia in this paper he means acute muco-purulent or catarrhal conjunctivitis, and does not include trachoma. He gives in tabulated form the statistics of the bacteriology of the simple and the very chronic ophthalmia in the endemic period, of acute ophthalmia in the epidemic period, and of the severe and the slight ulcers throughout the whole year. In the endemic period the gonococcus does not always give rise to corneal ulceration, but in the epidemic period the gonococcus nearly always causes corneal ulceration, and the ulcers generally perforate. The Morax-Axenfeld diplobacillus is the chief agent in making a simple case a chronic one. The Koch-Weeks is chiefly associated with the epidemic acute ophthalmia, being found in 66% of the cases, and the pneumococcus is found in 22%. In severe ulcers the gonococcus is found in 40% of the cases and mixed infections in 25%, pneumococcus 15%, while in slight ulcers mixed infections are found in 30%, pneumococcus 26.1% and Koch-Weeks bacillus 21.8%. The table shows that a mixed infection is much more likely to attack the cornea than a simple infection (with the exception of the gonococcus). The epidemic of ophthalmia commences annually in July. The proportion of cases increases rapidly till August, when, as regards numbers, the epidemic is at its height. After August the percentage of cases falls, but the virulence increases till November. In November and December the cases are fewer in number, but they are of a far graver type. Very many of the cases at the end of the year become complicated by corneal ulcers and a large number of ulcers perforate. In January the epidemic decreases rapidly, and in March, April and May there are very few cases, and these slight ones.

At present no reason can be given for the prevalence of ophthalmia in Palestine. All the conditions of the Near East—the dust, heat, flies, dirt and lack of sanitation—are to be found elsewhere unaccompanied by either ophthalmia or trachoma. The presence of the gonococcus in many of the cases is another anomaly, for practically none of the sufferers from gonorrhoeal ophthalmia have gonorrhoea. Ophthalmia neonatorum is unknown in Palestine; syphilitic iritis and chorioiditis,

interstitial keratitis and other similar conditions are very rare in the Jerusalem clinic.

The first sufferers in the epidemic are generally children, often babies one or two years old and, spreading from the children, the epidemic becomes general. There is much overcrowding, much dirt and no sanitation, water is scarce and flies are no doubt important agents in dissemination of the disease. Great care must be exercised in guarding against infection. Spectacles with a gauze screen should always be worn to keep out the flies.

The onset is rapid, one eye generally being affected first. It may commence as catarrhal conjunctivitis, muco-purulent discharge may appear and eventually become purulent. Pain is generally slight and photophobia absent unless there is corneal complication. Under treatment ophthalmia lasts from a few days to a month or more, but untreated, the cases become chronic and drag on for months.

Twenty-two per cent of all cases which come up for treatment have or acquire corneal lesions, and 46 per cent of all the ulcers perforate. Ulceration takes place in the first two or three days of the disease and only rarely occurs while the case is under treatment. The ulcers assume various types which he describes.

As regards treatment protargol was found to be very superior to both argyrol and silver nitrate, which were found to have about equal action. The lids are swabbed once daily with a 33 per cent solution of protargol and a collyrium of 5 per cent or 10 per cent solution of the same is used every two or four hours according to the case, in addition to frequent irrigation with boric acid or other mild lotions. All cases which become chronic, if they show the diplobacillus should be treated with zinc sulphate 1 to 2 per cent. Ulcers are treated along the customary lines. Protargol he believes exerts a most favorable influence upon the healing of corneal lesions. If the ulcer begins to spread or to deepen, no time should be lost in using the actual cautery or in applying pure phenol. Various tables of statistics accompany the paper and complete descriptions of the various bacteria.

W. E. B.

An Unusual Form of Cyst of the Iris.

COATS, GEORGE (*Royal London Ophthalmic Hospital Reports*, March, 1907). 'Pathologically, it showed an unusual development of the condition known as adenoma, or epithelial hyperplasia, of a ciliary process, while clinically it presented appearances which led inevitably to the diagnosis of sarcoma of the ciliary body, and to the enucleation of the eye, although in fact, no malignant disease was present. W. E. R.

ABSTRACTS FROM GERMAN OPHTHALMIC LITERATURE.

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The Action of Roentgen Rays on the Human Eye.

PROF. A. BIRCH-HIRSCHFELD, Leipsic (*Archiv f. Ophthalmologic*, lxvi, 1). In a previous article the author reported the anatomical findings in an eye which had been exposed to prolonged radiation during treatment of carcinoma of the temple. The principal changes were degeneration of the endothelium and vacuolization in the vessels of the iris and retina. The ganglion cells of the retina showed vacuolization, solution of chromatin, shrinking of nuclei and cell degeneration. The changes were especially marked in the macular region where there was pronounced cystoid degeneration. There were no signs of inflammation.

These changes were most naturally explained by the assumption of an exudation, which might follow the vascular changes which were analogous to those described by others following the action of Roentgen Rays. The same changes, however, have been attributed to other causes, and it is of interest to note the conclusions reached in two similar cases:

Case 1. Man, aged 30 years, with small sarcoma of choroid behind the ciliary body. $V=0.5$. In 4 days, 3 exposures of 7

minutes each with the tube directly on the sclera, over the tumor. The tumor increased rapidly. On the sixth day, detachment of retina; later a slight neuritis; enucleation.

The sarcoma showed good nuclear staining and no cell degeneration. Iris and ciliary body normal; no vascular degeneration. The optic nerve showed an acute neuritis. The retina surrounding the papilla was separated by exudate from the pigment epithelium, the detachment extending, with interruption, to the tumor.

This condition with the subretinal exudate, may be attributed to the tumor rather than to the action of the rays. A thorough examination of the retina showed changes in the ganglion cells and edema of the inner layers of the retina, which also cannot positively be charged to the Roentgen Rays.

There were very slight vascular changes which might be the commencement of degeneration.

Case 2. Man, aged 63. Carcinoma of outer angle of lids. Treated 6 times, 20 minutes each, during which the eye was protected as much as possible by lead and Stanniol. During the treatment the vision is said to have failed, although the eyeball was not affected by the growth which was controlled by the treatment for some time. After a long interval the patient returned with a recurrence involving the conjunctiva to the cornea temporally, with slight pannus and faint punctate opacities which had followed the previous exposures. After an intense exposure, duration not stated, enucleation. In the superficial layers of the cornea were a few isolated spots where there were scars of former lesions attributed to the earlier exposures.

In iris and ciliary body no signs of inflammation but well marked vascular degeneration, affecting the intima. The retina was not detached. The ganglion cells showed marked degeneration, chiefly in loss of chromatin and vacuolization of the protoplasm. The retinal vessels also showed changes.

The macula and optic nerve were free from pathological changes. These changes in the ganglion cells and vessel walls are believed by the author to be due to the action of the radiation, the vascular changes, especially to the exposure of the previous time, since in animal experimentation the author had noted the slow development of such changes.

The ganglion cell changes are probably more recent, if one may judge from changes following the action of radium and may be due to the last exposure. The functional variations dependent upon the changes described, were not determined. Are the changes in the nerve cells to be considered as a result of the vascular changes?

Baermann and Linser were of the opinion that the epithelial changes depended upon a primary lesion of the vessel walls. The author takes the opposite view and believes that the retinal changes, as well as those of the endothelium of the vessels, are a direct result of the action of the X-Rays, but the exact sequence of events is not yet established.

In view of the general use of X-Rays and Radium, it is important that those changes which seem to follow their use should be widely realized that the eye ball may be protected.

Selenowsky also in experiments with rabbits has demonstrated the danger of the excessive or careless use of these agents and it is interesting to note that in abstracts of his article exactly the opposite impression was given and their indiscriminate use encouraged.

C. W. C.

The Different Kinds of Absolute Localization in Concomitant Squint.

OHM, DR. JOHN, Berlin (*Archiv f. Ophthalmologie*, 1xvi-1.) It is well known that even those who have normal binocular vision, see comparatively few things in their true place. We differentiate, therefore, between objective or geometric or real space, and subjective or visual space. This disharmony which exists normally is still more marked in those who squint. For its investigation there are two methods of examination: first, the so-called touch test (*Tastversuch*) which gives information regarding the direction of any object in the glance field, from the nodal point of a so-called cyclop's eye. (*Sehrichtung, Hering*). The second method helps only to determine the relation of the subjective median plane or "straight ahead," to the objective median plane of the body of the examined, which it does in a more delicate manner.

The details must be read in the original as the article cannot be abstracted and the diagrams are important for their easier comprehension.

The author's summary may be stated briefly: For a hundred years two theories have been offered to explain the space sense; one, the projection theory, assumes that we refer or project objects seen, from the retinal images along the lines which the rays take from the object to the retina.

The second theory assumes for two identical retinal points, a common hypothetical point, to which the combined perception is referred. The first theory does not explain the physiological double vision, still less the pathological, while the theory of identical points satisfies the demands of the author's observations. Helmholtz and Hering are quoted regarding the imaginary "cyclops eye," the latter as follows:

"We may represent both eyes by a single imaginary eye which lies in the middle between both eyes. As such an eye must be innervated in order to move to the right or left, upwards or downwards, so both eyes are always uniformly innervated."

The author attempts to apply this scheme to the study of localization in squint, and asks, "Since the direction of this imaginary eye corresponds to the direction of vision, what position must such an eye have in relation to an object lying for instance, in the median plane, in order that the images received by two eyes in squinting, which we conceive as united in the one imaginary eye, shall be localized as they actually are?" Three classes of strabismus are considered—first, alternating, in which localization follows well known rules. Second, unilateral strabismus in which the error of localization is similar in many respects to that of paralysis of a lateral muscle. A third class in which alternating strabismus with one eye predominating in squint, shows the difficulties of the investigation and the impossibility of generalizing.

The results are as follows: 1. False absolute localization is not peculiar to paralysis of an ocular muscle, but may occur in certain forms of concomitant squint. 2. Lateral localization is the product of lateral innervation and the position of the images on the retina.

C. W. C.

The Question of the Macula.

GULLSTRAND, PROF. A., Upsala (*Archiv f. Ophthalmologie*, 1xvi-1.) The first question is regarding a difference of opinion as to the color of the Macula lutea in the human re-

tina. The author describes at some length his grounds for a belief which differs from that recently expressed by Dimmer, who described the yellow color of the macula itself, while Gullstrand attributes this color, which he calls orange, to the underlying pigment and explains Dimmer's impression by contrast and color induction.

The discussion is an old one and covers much of the ground so industriously worked by both writers in previous numbers of the Archives and elsewhere, and is a part of physiological optics.

Regarding the entoptic fovea and the nature and significance, in relation especially to the color of the macula, of Maxwell's spot, and on many other points Gullstrand takes vigorous exception to Dimmer's views.

The yellow color of the macula after death is discussed at great length, although the author has no evidence to add to his previous assumption that the retina is infiltrated with a yellowish fluid from the blood or from the chorioid and that the thickened walls of the macula (post mortem) make the fovea more noticeably yellow.

The color perception in the macula is next considered. It has been believed by many that the difference between the central and paracentral color sense, as well as Maxwell's spot could be explained by the absorption of light of short wave lengths in the center and W. Nagel is quoted as assuming from this, the existence of a yellow pigment. (The citation does not, however, give this impression.)

The author is quite positive, on the other hand, that he has explained the difference between the central and the paracentral vision in accordance with physical facts. These depend on the author's observations which are very difficult to verify.

C. W. C.

Reading with Vertical Lines.

DIMMER, PROF. F., Graz (*Archiv f. Ophthalmologie*, 1xvi-1.) An account of a boy of nine who could only read easily when the print was held so that the lines were vertical. Since infancy there had been lateral nystagmus. There was no apparent movement of the letters but Dimmer assumes that this was present possibly when reading was first attempted, and to avoid the confusion of letters blurred by overlapping laterally, the strange position was taken in compensation.

Experiments with a camera in which the print photographed was given an oscillating motion parallel to the lines, gave an illegible result, while with a movement at right angles, as in the case of the child, the print was easily read.

C. W. C.

An Experimental Proof of the Importance of the Hole in the Mirror for the Movement of the Shadow in Skiascopy.

BORSCHKE, ALFRED, Vienna (*Archiv f. Ophthalmologie*, lxvi-1.) A controversial article in which the author defends his position against attacks of Weinbold, and demonstrates to his own satisfaction that the diaphragm formed by the hole in the mirror is indispensable and that changes in its size or position influences very materially the accuracy of the test. The changes in the appearance of the shadow which are caused by movements backward or forward of the opening, seem to be in proportion to the ametropia, especially the astigmatism.

C. W. C.

An Epibulbar Pigmented Sarcoma.

SICHERER (*Zeitschrift f. Augenheilk.*, xvii, 5). Sicherer reports a case resulting from the growth of a pigmented naevus after the patient's 70th year of age. The naevi were said by the patient to have been present since earliest youth. The patient refused surgical interference until the growth prevented closure of the lids, when a piece was removed. Further surgical treatment was refused. The growth became very large, and multiple metastases occurring in the liver and kidneys, death followed.

F. K.

Contribution to the Etiology of Increased Intraocular Tension.

HESSE (*Zeitschrift f. Augenheilk.*, xvii, 5). The author reports two cases of glaucoma arising in patients from the increased volume of the senile cataractous lens, in previously normal eyes. He believes that the glaucomatous symptoms were due solely to the obliteration of the angle of the anterior chamber by the swollen lens. The patients were old people, suffering from senile cataract, in whom glaucomatous symptoms suddenly arose. After operation, the glaucomatous cupping of the optic nerve was absent.

F. K.

Contribution to the Subject of Xerosis Conjunctivae After Pemphigus.

AMBERG (*Zeitschrift f. Augenheilk.*, xvii, 5). Amberg reports the case of a 9-year-old boy, who, at the age of four years, after rather poor previous health, developed an attack of general pemphigus, which appeared four weeks after vaccination. The latter caused a severe general reaction, the pustules healing after two weeks. The bullæ first appeared in the mouth but gradually spread until the whole body was covered. The evacuation of the fluid contents, was followed by scab formation. Two months later, after a complete remission of two weeks, a second and more severe attack occurred and was accompanied by a severe ocular inflammation, though no bullæ appeared on the lids or the eyes. The inflammation disappeared after six months, a white spot being apparent on the cornea. Recurrent attacks were numerous for three years, at the end of which period—there was present symblepharon of both eyes with beginning ankyloblepharon. The conjunctival sacs were missing. The conjunctiva was immovable, very dry, parchment-like, and of a dirty, yellow tint. The cornea was covered with a similar membrane, allowing the iris to appear as through tissue paper. Bloodvessels, plica semilunaris, caruncle and lacrimal ducts were absent and there was no conjunctiva or lacrimal secretion. A small piece of tissue removed from the bulbar conjunctiva showed histologically that the epithelium was thickened and of an epidermoidal type. Upon the basal layer of high cylindrical cells were three or four layers of polygonal cells, with plainly seen intercellular bridges. Upon these were two or three layers of spindle shaped cells which gradually became flatter and showed less staining ability. On the surface there was a narrow zone of horny cells, without nuclei, in which were found a large number of club-shaped bacilli resembling diphtheria bacilli. F. K.

Contribution to the Study of Lamellar Cataract.

RUHWANDL (*Zeitschrift f. Augenheilk.*, xvii, 5 and 6). After a microscopic study of ten specimens collected from six cases of lamellar cataract, which were operated upon, Ruhwandl believes that lamellar cataract is rarely due to traumatism. Its apparent appearance later in life, he thinks, is due

to the fact that many of the minor grades are overlooked unless carefully examined with dilated pupil. As the tendency of lamellar cataract is to advance, it becomes noticeable to the patient in later years. He believes that it is due to an unknown injury acting for a brief period soon after the formation, embryologically, of the first lenticular fibres. F. K.

The Relationship Between Mikulicz Disease and Tuberculosis.

NAPP (*Zeitschrift f. Augenheilk.*, xvii, 6). Mikulicz describes this disease as an intense swelling of the lacrimal and salivary glands. It may be limited to the lacrimal gland, in which it usually begins, or it may additionally involve the salivary glands. Numerous cases have been reported since, in which other lymph glands of the body were involved. Fleischer, Osler, and Mellor were unable to find tubercle bacilli, though there were indications of a tuberculous character.

Napp reports a case in 27-year-old married woman, who had two children and two miscarriages. Syphilis was denied. Her husband had pulmonary affection two years before, but had apparently recovered. On Nov. 1, 1906, the patient developed a bilateral swelling of the parotid and submaxillary glands. Eight days after there was involvement of both lacrimal glands, which swelling had remained. At the end of November, a large number of nodules, the size of hazel nuts, appeared in the mucous membrane of the mouth. When first seen, in February, these symmetrically placed swellings were evident in the salivary and lacrimal glands. The swellings on the lip and mucous membrane of the cheek were greyish-red, with a yellowish tinge in places, and were not ulcerated.

The entire conjunctiva bulbi of both eyes showed many submiliary tubercles, resembling lymphangiectasias. The palpebral conjunctiva was pushed forward by numerous small excrescences of an average size of 1 to 2 mm, which were dark in color in contrast with this deeply injected conjunctiva. Examination showed a half moist catarrh of the apex of the left lung and a history of night sweats was obtained. There was no evidence of syphilis.

The microscopic examination of sections of the palpebral conjunctiva showed miliary tubercles composed of epithelioid cells, many giant cells, and a surrounding wall of lympho-

cytes. In isolated cases, the centre had undergone caseous degeneration and between the epithelioid cells, there were a few tubercle bacilli. F. K.

Concerning Infiltration Anesthesia in Diseases of the Eye.

STUTZER (*Zeitschrift f. Augenheilk.*, xvii, 6), The author believes that local infiltration anesthesia has not received the attention in eye surgery which it has in general surgery. He employs it very extensively and believes it to be superior to general anesthesia in most operations about the eye. He uses a 1% or 0.5% cocaine solution in physiologic salt solution, to each c.c. of which he adds one drop of adrenalin solution. This solution is boiled before use.

In operations on the globe and conjunctiva, he uses the solution by subconjunctival injection. In lid and lacrimal sac operations, he infiltrates the tissue in which the nerves supplying the parts operated upon are located, after the manner of Oberst. F. K.

The Genesis of Ringshaped Opacities on the Anterior Surface of the Lens After Contusion of the Eye.

KRUSIUS (*Zeitschrift f. Augenheilk.*, xvii, 6). Krusius describes the appearance of a fine ring about 1 m.m. in diameter on the anterior surface of the lens, and a smaller one upon the posterior corneal surface or Descemet's membrane at a point directly opposite, immediately after an accidental blow by a piece of the blade of a sword.

He believes that the opacities were caused by the traumatism forcing the cornea and pupillary edge of the iris against the underlying lens. The opacity was apparent only upon the use of a mydriatic. The zonula was apparently strong enough to prevent posterior luxation of the lens. F. K.

The Changes in the Ocular Apparatus in Malformations of the Skull, and Their Causes with Especial Reference to the So-Called Dome Shaped Skull and Rachitis.

KRAUSS (*Zeitschrift f. Augenheilk.*, xvii, 5 and 6). The author believes that Enslin is too extreme in asserting that optic atrophy is associated with a certain characteristic type of domeshaped head, and that there is no principal difference between this form and the rachitic pseudo-domeshaped skull of Cohen.

The exophthalmos and other eye changes occur when the bony growth of the skull is pathologically affected so that the volume of the contents of the skull and orbit are not in accord with the shape of the skull. This disproportion is due to the embryologic fact that the skull is partly of cartilaginous and partly of membranous formation.

The pathologic changes take place at different times in the embryologic state and occur in varying parts of the skull. The base of the skull shows abnormalities in configurations which are explained by the cartilaginous ossification centers, while changes in the sides and roof of the skull are caused by an abnormally early closure of the fontanelles and fissures, due to early membranous ossification. The different shapes of the skull are due to the varying factors involving base, side and roof of the skull, or individual bones.

Krauss reports a case of domeshaped head in a 20-year-old boy, with a negative family history. There was marked exophthalmos and diminution in ocular movements in all directions, especially toward the right; upward movements and convergence were barely perceptible. The orbits were asymmetrical. Vision was reduced to light perception in the left, and was slightly better in the right eye. Ophthalmoscopically, there was total postneuritic optic atrophy. Functional albuminuria was present but no symptoms of paresis, etc.

Roentgen radiographs, compared with those of a normal skull, showed an apparent dislocation of the sphenoid bone anteriorly beginning apparently at the sella turcica, causing a depression of the anterior part of the sphenoid bone, especially of the small wing of the sphenoid, and the frontal part of the greater wing of the sphenoid. The orbit was thus greatly encroached upon, and optic atrophy caused by pressure in the narrowed optic canal.

Krauss believes that the asymmetry is due to the chronic inflammatory disease of the bony system of the skull, probably of the same character as in rachitis.

The shape of the skull is influenced by the compensatory stretching of the skull in the direction of least resistance caused by the pressure of the contents of the skull. He thinks that further studies with radiographs should be made.

F. K.

Two Cases of Contralateral Visual Disturbance Following Operation on the Spine of the Nasal Septum, One Case Being Complicated by Blindness on the Operated Side Accompanied by Meningeal Symptoms.

LAAS (*Zeitschrift f. Augenheilk.*, xviii, 2). Laas reports two interesting cases showing the relationship between diseases of the nose and those of the eye, and how a comparatively minor and frequent operation may result in serious visual disturbance.

Case 1—Man 33 years of age, bricklayer, suffering from bilateral hypertrophic rhinitis, hypertrophied tonsils, with a spine and deviation of the nasal septum on the left side, after a negative course of iodide of potassium, was operated upon at intervals, the tonsils being removed first, and then the hyperplasia of the turbinates of both sides. Nine days later, the spina septi was removed from the left side by chisels, in two pieces, 4 cm long and $2\frac{1}{2}$ cm wide in all, under local anæsthesia. Fifteen minutes later, after resting upon a sofa, head low, the patient complained of flashes of light before the right eye and dim vision toward the right side.

The visual test of the right eye then showed blindness in the entire upper field, the pupil reacting fully to light and accommodation, and being wider than the left pupil. Ophthalmoscopically, the eye grounds of both eyes were normal. The left eye had normal vision and fields. The right eye could not count fingers on account of the defect in the whole of the upper field.

The vision in the right eye gradually improved to 5-10 of normal, four months later, though the optic nerve became pure white as in total optic atrophy. The field remained hemianopic in the upper half. Hemianopic pupillary reaction was present. The author thinks that there was produced a fracture of the wall of the right optic nerve canal, which caused a tearing of part of the optic nerve.

Onodi found 35 modifications in the relationship between the sphenoid cells and the posterior ethmoid cells, to the optic canal of both sides and the sulcus optici, and explains the clinical appearances of cases in which there is optic atrophy of the left eye in cases of inflammation and pus collection in the posterior ethmoid cells or sphenoid cells of the right side, by the fact that the right sphenoid cells or the posterior ethmoid

cells form the wall of the left optic canal. This wall is very thin and easily fractured. The author believes that in chiseling the spina septi upward and posteriorly there was a fracture of the neighboring sphenoid or ethmoid cells extending into the optic canal.

Case 2.—A patient of Professor Kuttner was operated upon with a motor nasal saw for the removal of an exostosis on the posterior part of the septum on the left side. The operation was carefully done, lasting but one minute. The patient sat with closed eyes very quietly until after the operation. Immediately upon opening his eyes he stated that he could see nothing with his left eye. He became feverish and lapsed into a semi-conscious state. The neck and spine developed rigidity, movements causing the patient to moan. There was general muscular weakness.

The left pupil did not react to light. The right pupil reacted promptly to light when the source was directly front or to the left. To indirect light the left was active and the right pupil inactive. Both pupils responded actively to convergence. The eye grounds appeared normal. One month later, the right nerve was nearly normal, the left very pale, the vessels being normal.

The nervous symptoms gradually lessened, the patient being physically weak upon his discharge two months after the operation. His vision in the right eye at this time was 5-12, the field club-shaped and much reduced, especially in the temporal half. The left eye remained blind.

The author believes that a fracture occurred in the anterior angle of the chiasm, causing destruction of the left optic nerve and partial injury to the right nerve. This fracture is explained as in the preceding case. F. K.

The Solution of the Problem of Ball Implantation.

SCHMITT (*Zeitschrift f. Augenheilk.*, xviii, 2). Schmitt contributes further results of cases operated upon by him and reported previously, and adds a fourth one operated upon five months before. In every case, the ball remained quiet and caused no symptoms, though implanted 5 mos. to 8 1-4 years. The second eye remained absolutely unaffected. The eyes operated on were remarkably free from pain at all times after the insertion of the ball. F. K.

Observations on Senile Cataract with Secondary Glaucoma.

ULBRICH (*Zeitschrift f. Augenheilkunde*, xviii, 2). Ulbrich adds three cases of secondary glaucoma due to swelling of the senile cataractions lens, to those reported by Hesse in the May number of the *Zeitschrift*. In each case, the glaucomatous symptoms disappeared after an iridectomy followed shortly by extraction of the lens. He believes that it is safer to do an iridectomy first, and follow with extraction of the lens at a later period, as there is less disposition to intra-ocular hemorrhage.

F. K.

Circumscribed Atrophy of the Annulus Iridis Minor in Increase of Tension.

HIRSCHBERG, J. (*Centralbl. f. prakt. Augenheilk.*, June, 1907.) The author describes three cases of the above, with drawings, and lays down the following laws: 1. Permanent, circumscribed dilation of the pupil appears in a few cases of mild, inflammatory glaucoma, which yields to eserine and leaves normal, or nearly normal, vision, and fields of vision. The cause is *a corresponding circumscribed atrophy of the tissue in the small circle of the iris* (i. e., in the region of the sphincter.)

2. If an eye with normal vision and of normal aspect (save for a slight hardness) is attacked by a severe type of glaucoma and is at once successfully operated upon, there are very frequently observed bluish, excavated areas in the small circle of the iris, although the pupillary movement is not restricted thereby.

3. In all cases of inflammatory glaucoma, where the operation has either preserved or restored a serviceable vision and field of vision, but where for some years a permanent dilation of the pupil remains (always a less favorable symptom, which, however, does not always denote the imminent loss of vision) *there will be found a circumscribed atrophy in the region of the small circle of the iris.*

4. In pressure degeneration of the bulbus, *there are atrophic spots in both large and small circles.*

C. L.

A Mucous Cyst of the Orbit with an Oil-Like Content.

SPERBER, E.M. (*Centralbl. f. prakt. Augenheilk.*, May, 1907.) The author reports such a case. The tumor lay above the inner canthus, was fluctuating, but showed no sign of inflam-

mation. Incision yielded more than a tablespoon of a slightly cloudy, yellowish-green, muco-oleaginous, semi-fluid mass, from a cavity about the size of a hen's egg. This was drained by gauze and healed from the bottom. The author refers to four other cases. C. L.

Surgical Cure of a Circumscribed Abscess in the Vitreous.

CRAMER, E. (*Centralbl. f. Augenheilk.*, June, 1907). Cramer described a case of a patient struck on the eye by a piece of a match. This penetrated the sclera and caused an abscess of the vitreous, which was evacuated through the sclera. No foreign body was found, and there was no loss of vitreous. The result was good. C. L.

Diseases of the Eye in Calsson Workers.

PICK (*Centralbl. f. prakt. Augenheilk.*, June, 1907). After reviewing the literature, Pick reports the following very rare case: Five days after admission, neuritis optica appeared in both eyes with slight edema of the macular region. In the right eye there were about 12 white retinitic foci of opaque homogeneous appearances, lying upon the terminations of veins. In the left eye were six similar foci. Three days later small hemorrhage was evident in the right eye at the end of a macular vein. The process gradually cleared up, and vision returned to normal. C. L.

A Rare Case of Spontaneous Reattachment of a Detached Retina.

HIRSCHBERG, J. (*Centralbl. f. prakt. Augenheilk.*, March, 1907.) reports a case where detachment of the retina followed a blow on the right eye three weeks after the accident. Treatment had no result. Allowed to go to country for summer, on his return about one month later, the retina had reattached itself almost entirely, and two months later, the reattachment was complete. C. L.

A Case of Bilateral Blindness Caused by Gun-Shot Wound of the Temple.

HIRSCHBERG, J. (*Centralbl. f. prakt. Augenheilk.*, March, 1907.) reports this case. As is frequently found, the eye on the side where the shot entered was blinded by severance of the nerve, while the other eye suffered from rupture of the sclera caused by the shot or a splinter from it. C. L.

Foreign Body Healed in the Iris Not Irritating the Otherwise Normal Eye.

BOCK, EMIL (*Centralbl. f. prakt. Augenheilk.*, March, 1907) reports two cases where a foreign body penetrated into the eye, became encapsulated in the anterior surface of the iris and was borne for years without causing untoward symptoms. The first was a piece of common coal and the second was a splinter of wood. In each case, at the time of the accident, there had been a slight iritis which was confined to the point of trauma. C. L.

Concerning Corneal Transplantation.

ZIRM, E. (*Wiener klinische Wochenschrift*, January, 1907). The author publishes a case of successful corneal transplantation, probably the first case of its kind on record. The patient had received a lime burn of both eyes, vision being reduced to mere light perception. The transplanted cornea was obtained from the enucleated eye of a boy. The operation in one eye was followed by a brilliant result, in the other it was a failure. Vision in the good eye, as elicited by Dr. Meller of the Fuchs' clinic, one year after operation, was with stenopeic slit 6-36; better still with +5 spherical. With +16 and +20 sph. Jaeger No. 6 was read easily, No. 4 with effort.

The fundus was readily discernible through the large transparent portion of the healed-in corneal graft. In its lower portion there was a superficial stationary opacity. The graft possessed sensibility. The vascular manifestations from the adjacent leucomatous tissue apparently did not encroach beyond the boundaries of the new cornea. The corneal microscope however revealed many fine vessels coursing over the lower half. Above and internally the graft was separated from the surrounding scar tissue by a narrow white line, below by a less well defined line of demarcation.

The perfect transparency of the upper portion he ascribes mainly to the healthy condition of the original subjacent corneal layers. According to Zirm the success of the operation is dependent upon:

1. Utilization of human cornea exclusively; if possible from a young subject. The cornea to be transplanted must be in a favorable state of nutrition.

2. The use of v. Hippel's trephine exclusively. If an anterior chamber still exists eserin instillations before the operation.

3. Complete anesthesia, rigid asepsis, no antiseptics.

4. Preservation of the graft between two gauze pads moistened with sterile normal salt solution and held over warm vapors. Insertion of the graft without the aid of instruments.

5. Retention of the graft by two crossed sutures, the ends fastened to the bulbar conjunctiva.

6. Selection of suitable cases,—preparatory operation if necessary.

Such cases include corneal burns, pannus, moderately deep scars following ulceration—cases in which the deeper layers of the cornea are still functionally active. When the cornea is transformed into an indurated ectatic structure, poorly vascularized, the ordinary trephining operation promises little. For these cases, the writer has devised a preliminary conjunctival plastic operation. The superficial layers of the cicatrix are excised, the surrounding bulbar conjunctiva dissected free and its margins approximated to the denuded surface by a purse string suture. The nutrition of this surface thereby in time becomes augmented, and after transplantation there is a probability that sufficient nutriment can be derived from it without necessitating vascular penetration.

Cases of central corneal opacity in his belief seem particularly fitted for kerato-plastic surgery, the normal condition of the surrounding cornea distinctly favoring operative success. The periphery of the cornea is probably better adapted for transplantation than the rather more poorly nourished central portion.

A. C. S.

Fibroma of the Orbit.

KOENIGSHOEFER (*Die ophth. Klinik sc.* No. 3, 1907). Koenigshoefer describes a case of fibroma of the left orbit in a young man. Vision in the right eye was $\frac{5}{4}$, in the left eye fingers counted at $4\frac{1}{2}$ meters. The left eyeball was luxated forward, upward and slightly outward, the cornea being completely covered by the upper lid. There was limitation of ocular motility down and out. Eversion of the lower lid resulted in a marked protrusion of the conjunctival fold, palpation of

which revealed a solid tumor mass apparently extending far into the orbit. The lower orbital rim, especially its outer portion, seemed depressed and roughened. The mass was not compressible nor could it be pushed back into the orbit. It did not participate in the ocular movements. A mild form of choked disk was present in the affected eye.

Because of its non-inflammatory character, its gradual growth (4 years) and its lack of connection with adjacent structures, he believed the tumor benign and decided to operate without disturbing the eyeball. His decision between a Kroenlein operation and an operation from in front, was influenced in favor of the latter method by the marked protrusion of the tumor anteriorly, by its consistency, suggesting a probable easy enucleation, and by the depressed condition of the lower orbital rim. Its size made him select the trans-palpebral rather than the trans-conjunctival route.

Operation: He made a curved incision beginning 1.5 c. m. below the internal canthus to a point on a level with the outer commissure. The tumor appeared in the wound as a pale red mass and its delivery was comparatively easy as there were few adhesions. Hemorrhage was not severe. The cavity was then packed with iodoform gauze and the wound edges partially approximated by sutures. The wound healed rapidly.

About two weeks after the operation a moderate enophthalmos and ptosis developed, probably due to the absorption of a retrobulbar hemorrhage. There was also slight divergent strabismus. All these conditions were considerably improved by a tenotomy of the external rectus. Visual acuity, which had fallen immediately after the operation, gradually increased to where it stood before the operation.

The tumor was about the size of a hen's egg the microscopical diagnosis (Dr. Lepmann) being (a) fibroma with central softening and secondary degeneration (b) endothelioma arising from the lymph-endothelial cells of the adventitia. The author found only seven cases of true orbital fibroma in the literature and none in which there was an endotheliomatous transformation.

A. C. S.

A Case of Infraction of the Cornea.

MAJEWSKI (*Die ophth. Klinik*, No. 5, 1907). The author cites a case of infraction of the cornea produced by the blunt pointed blade of a bandage scissors hurled against the cornea. There was intense pain and lacrimation immediately following the accident; the subjective symptoms gradually increased in severity and five hours later the patient consulted the writer. At this time there was intense blepharospasm and lacrimation, also slight ciliary injection. The cornea appeared normal but by focal illumination and with the loupe a straight horizontal corneal rent was discovered extending 1-2 mm. from the inner corneal margin to within a few mm. of the outer corneal margin. It was situated below the horizontal corneal diameter and as it reached the temporal border it gradually faded from view. As yet there was no opacity except below where the corneal surface was slightly opalescent. The rest of the media were clear, the fundus normal, ciliary tenderness was present in the upper outer quadrant. The keratoscope revealed no corneal astigmatism.

During the next few days, the subjective symptoms became still more severe, the lesion assumed a greyish aspect and the opalescence below became more marked. The iris was decidedly hyperemic, the pupil contracted and there was ciliary injection. The symptoms then gradually subsided, the horizontal linear opacity becoming less conspicuous, whereas a fan shaped opacity, apex pointing down now presented itself below. Ten days after the accident, the eye was quiet, the cornea entirely clear aside from a linear scar. The therapy comprised cocain, adrenalin, iced compresses followed later by atropin and dionin. In five months the lesion could only be discovered by focal illumination. Vision was normal.

He attributes the corneal condition to a sudden compression of the cornea by the flattened extremity of the scissor blade, the subsequent epithelial alterations as secondary to the compression. Such an interpretation is in accord with the clinical history.

He briefly refers to another instance in which a dendritic opacity resulted, and to similar corneal infractions, during cataract operations by the large flap incision, in the latter the conditions being somewhat different from those in the ordinary case where the cornea, immediately resumes its original

shape. The objective symptoms suggestive of infraction are a linear, but not necessarily dense, opacity associated with disproportionately acute subjective symptoms. He can conceive of cases, however, where no circumscribed opacities would follow, namely by impact of objects with more flattened, smooth surfaces which would cause momentarily a condition resembling corneal collapse. A. C. S.

On the Treatment of Affections of the Lacrimal Sac and Extirpation of the Lacrimal Sac.

LANDOLT, H. (*Die ophthalmol. Klinik*, No. 2, 1907). Recent cases of dacryo-cysto-blenorrhœa he treats by conjunctival instillations of cocain, cocain-adrenalin with or without zinc sulphate. The instillations are followed by massage of the sac according to Koenigshoefer's method. These measures proving unsuccessful he starts probing, at first without slitting the canaliculus. In the more chronic cases with cicatricial stenosis of the nasal duct, he first resorts to probing combined with astringent or antiseptic injections and massage. Slow response to this treatment calls for extirpation of the sac. Much dilated sacs are best removed at once.

Extirpation of the sac: He controls hemorrhage by subcutaneous injections of a mixture of cocain and adrenalin—(cocain 1% —9 parts, adrenalin 0.1% —1 part). These are made preferably just before administering the general anesthetic. Should a general anesthetic be unnecessary he waits 10-15 minutes after making the injections, which are both superficial and deep. A curved incision is then made with its concavity towards the eye, commencing about .75 c. m. above the inner margin and extending to about 2 c. m. below the lower lid margin. The incision is made .5 c. m. distant from the inner angle of the lid. The wound is best held open by hooks in the hands of an assistant. After exposing the sac, the head is dissected free and pulled forward with the forceps. The whole sac is then dissected out and cut off deep within the nasal canal. The nasal canal is curetted, the wound cavity packed with iodoform gauze, and the skin edges united by three sutures. At the end of one or two days, the gauze strip is removed and a firm compress bandage applied. The sutures are removed in from 6-8 days. The resulting scar is hardly visible. The main object of the operation is to remove

the purulent focus, always a source of annoyance and danger to the patient. A. C. S.

Concerning Prophylaxis in Ophthalmia Neonatorum.

SEEFELDER (*Muench med. Woch.*, March 5, 1907.) Instillations of silver acetate (1%) in one eye, and silver nitrate (2%) in the fellow eye were made by the writer in five hundred infants, mainly to compare the resulting inflammatory reactions.

His conclusions based on these experiments lead him to assert that in silver acetate we possess a drug equal in efficiency to silver nitrate (as Thiess's statistics have shown), and not any more irritating; a drug which has the advantage over silver nitrate in that evaporation does not affect its concentration. A. C. S.

Spasm of Accommodation.

KOENIGSHOEFER (*Die ophthalm. Klinik.*, Nos. 23 and 24, 1906, Nos. 1, 2, 3, and 4, 1907.) Koenigshoefer shows that a spasm of accommodation really can occur in spite of those who argue that according to Donders, Hirschberg, and Hess such a condition is impossible. The writer considers the affection apart from myopia, a disease *sui generis* occurring in individuals who may not be myopic or predisposed to myopia. He realizes that its diagnosis is difficult and that consequently it often escapes detection. He defines it as a transient or continuous contraction of the ciliary muscle with inability to return by voluntary muscular relaxation to the normal muscle tone. He furthermore recognizes:

A. A true (persisting) spasm.

B. A concomitant spasm.

In the first class the subjective and objective refractions are practically identical; in the second the subjective refraction is higher than the objective, the cramp disappearing where the eye is not fixing.

Etiologically he divides accommodative spasms into

1. Spasms of central origin (functional neuroses, general intoxications, etc.)
2. Reflex spasms (neuralgia of the 5th nerve, muscle anomalies, lid and conjunctival affections, sinusitis, etc.)
3. Traumatic spasms (rarely due to direct traumatism of the ciliary muscle—usually reflex.)

4. Occupation spasms (he applies the term occupation to every visual act.)

All four varieties may occur either as true or concomitant spasms, generally however as concomitant spasms. True and concomitant spasms may be either acute, subacute or chronic.

In the following discourse he limits himself entirely to the true ciliary cramp, commencing by thoroughly reviewing the literature from the time of V. Graefe—Donder's book, "Die Anomalien der Refraction und Akkommodation des Auges," Wien, 1866, and proves that its author recognized the possibility of such a condition although he states that he has never seen an acute case. Donders considered these acute cases extremely rare, having never seen a case in 2,000 myopes. Königshöfer himself saw only four acute cases in 34,000 patients.

The writer then refers to articles on accommodative spasm associated with various neuroses, traumatism and other causes. The knowledge derived from such a resume is directly opposed to the stand taken by Hirschberg, who in the *Centralblatt f. Augenheilkunde*, 1884, p. 169, says that he hardly believes in the acute and not at all in the chronic spasms, that in many thousand cases examined by him by the direct method and by trial lenses he had never seen one case, that never did he find the objective refraction different before and after atropin cycloplegia.

To support his views, Königshöfer publishes the histories in full of eight cases of true spasms of accommodation. In nearly all there was more or less sudden visual decrease for instance associated with various conjunctival manifestations. Near objects appeared blurred and there was headache during and after close application. The three male cases were 17, 20 and 42 years of age; the five female cases under 16 years. He considers the question of sex unimportant but individuals under 20 are rather more predisposed. In four cases visual reduction was observed during the cramp and in one case it became especially marked during treatment and was probably an hysterical manifestation. In several there was a difference in degree of spasm in the two eyes. In one the effects of atropin rapidly disappeared; in two there was a very slow response to the cycloplegic in spite of prompt pupillary dilation. In no case was there any alteration in pupillary size or reaction during the cramp.

There was one case of true occupation spasm, four cases of central origin, but precipitated by reflex causes, two cases of combined reflex and occupation spasms and one case of uncertain etiology. Taking into consideration all the various exacerbations there were four instances of acute, four of sub-acute and two of chronic spasms, also two which started as chronic spasms and then became exacerbated. The cases teach that different etiological factors may be present in the same case, in fact such is the rule, acute ciliary spasm due to a single etiological factor being quite exceptional. While an individual predisposition must exist, such a predisposition is rarely found, many individuals being exposed to the same casual factor without contracting the affection.

In conclusion he criticizes Hess, who ascribes the ciliary contraction in hypermetropes to physiological conditions, and who believes the clinical determination of ciliary spasm to rest on faulty principles (the refraction of the disk not being the same as that of macula, etc.) While under certain conditions, Königshöfer admits these objections hold good, they can not explain conditions such as were present in ten cases of concomitant spasm which he publishes. A critical study of Hess' views however impresses one that he does not entirely deny the possible existence of a spasm of accommodation.

Summing up the picture of true ciliary spasm, he refers to the failing vision, to asthenopic symptoms, to slight decrease in the accommodative range and insufficiencies of the external recti or slight spasm of the internal recti, associated at times with convergence deficiency. The affection may be mistaken for a conjunctivitis, a primary disturbance of the muscle balance, or a rapid form of progressive myopia. As the condition generally occurs in anemic persons with hysterical or neurasthenic tendencies such mistakes are not uncommon. In one half of the cases the diagnosis is only reached after prolonged observation.

A. C. S.

**Studies on the Subject of Sympathetic Ophthalmia.
Further Experimental Investigations Concerning the Question of
the Influence of Irritation in the Eye, and the Modified
Nerve Theory.**

PAUL ROEMER (*Archiv f. Augenheilk.*, March, 1906). Römer has reported his own experiments upon the production of hemolysins in the aqueous after irritation of the eye, and

Wessley's method of estimating the increase of albumin, and finds that Wesseley's method as a rule gives more delicate tests. He has confirmed his earlier conclusions which agree with W's that neither method shows an increase of haemolysins or of the albumin in the aqueous of the fellow eye, when one eye is irritated, and that therefore the ciliary nerve theory for sympathetic ophthalmia must be definitely abandoned, as reflex transfers of irritation from one eye to the other are not demonstrable.

He discusses further Jesner's experiments, which seemed to show that section of the trigeminus on one side (which he considered irritation of the nerve), produced regularly an increase of albumin and exudation of fibrin in the aqueous of the opposite eye, a fact which despite Römer's and Wesseley's contrary results, could be considered as supporting the modified ciliary nerve theory. Leber has said that Jesner's results had yet to be explained. Römer repeated Jesner's experiments and found that while intracranial division of the trigeminus produced marked increase of the albumin and production of haemolysins in the aqueous of the eye on the same side, there was absolutely no increase of albumin in the fellow eye and no production of haemolysins. So that the last support of the ciliary nerve theory must be abandoned.

Schmidt-Rimpler has said the experiments of Römer and Wessley were not conclusive because they examined the normal aqueous which he considers to be derived from the iris, whereas the irritation producing sympathetic ophthalmia comes from the ciliary body, which has nothing to do with the secretion of the aqueous (in his opinion). While disputing the belief that secretion products from the ciliary body would not appear in the aqueous, Römer repeated his experiments, froze the eyes, removed the frozen disk in the posterior chamber and showed that it also contained no trace of haemolysins, so that no proof can be given that any disturbance of circulation as postulated by the ciliary nerve theory really occurs. Schmidt-Rimpler's claim that injury of one eye causes increased redness, lacrimation, weakness of accommodation and contraction of the pupil is undisputed, but this does not prove that thereby an *infectious process* is transferred to the second eye. No one doubts that a certain disposition of the second eye is required as in all infections but we can not believe

that the inflammation in the first eye can influence the condition of the nutrition of the fellow eye by a direct reflex path.

E. A. S.

Concerning the Passage Into the Blood of Organisms Causing Infection in Intra-Ocular Infections.

ROEMER (*Archiv f. Augenheilk.*, August and September, 1906). In order to determine whether organisms injected into the vitreous passed outward along the optic nerve, as the adherents of the migration theory believe, or whether on the other hand they are taken up with the blood channels and pass into other parts of the body and the other eye. Römer instituted a long series of experiments with organisms (1) producing septicemia, (2) producing metastasis, (3) saprophytes and (4) protozoa (trypanosomes). The organisms were injected by means of a syringe passed through the lens into the vitreous (rabbits being used). Subsequently the chiasm, optic nerve, eyeball, spleen, liver and heart blood were examined under most rigorous bacteriological precautions. The results obtained were that organisms could be shown in the blood inoculation within a few hours after inoculation and in the large organs of the body and most important of all in the iris of the second eye, *at a time when the optic nerves were absolutely free from microorganisms*. The optic nerves were found involved only very late and in these cases the infection could be considered as a metastatic one and not by continuity. He offers as conclusions of his experiments:

1. There is no microorganism which has been shown to fulfill the conditions of the migration hypothesis, after intraocular injections.

2. The spread of the organisms does not take place along the optic nerve, but the laws for the absorption of infection-producing organisms into the blood hold also for intraocular infections.

3. In this manner the organisms in a number of cases reached the uvea of the opposite eye. According to the results of this experimental investigation, we are compelled to exclude any further discussion of the migration hypothesis in the pathogenesis of sympathetic ophthalmic. Only if the adherents of the theory can find a microorganism which, when inoculated into an eye, can cause a growth along the optic

nerve, to the other eye and be limited to this path, will they have a right to show any justification for it. At this time he does not consider this proof possible. For the cases in which papillo-retinitis in the second eye disappeared after enucleation of the exciting eye, no good explanation has been offered either according to the migration theory or metastasis theory, although Schirmer suggests that the toxins of the organisms and not the organisms themselves reach the second eye and produce the inflammation. Further experiments on this question are required.

Römer then proceeds to a discussion of the objections to the metastatic theory of sympathetic iridocyclitis and concludes by a quotation from Fuch's paper that "Optic nerve and ciliary nerves are finally excluded as paths of infection; — and that the theory that sympathetic ophthalmia arises like the metastases from tumors (Berlin) while it is yet quite hypothetical, appears the best supported by the anatomical findings," and congratulates himself that what he has defended for years from a bacteriological and experimental standpoint is now supported from the anatomical side. E. A. S.

Postulates for the Investigation of the Etiology of Sympathetic Ophthalmia.

ROEMER (*Archiv f. Augenheilk.*, Oct., 1906). Römer suggests certain postulates for future investigators. First, the careful postmortem examination of the entire body should be made in the animals experimented upon. Secondly, the optic nerve should be carefully examined not only histologically but bacteriologically. For the latter it is important to make the examination as soon after death as possible, as within 24 hours bacteria causing putrefaction often appear especially within the skull. Thirdly the blood of patient should be examined for the presence of organisms, as the metastatic theory is the one which seems best to meet all conditions according to our present knowledge of the disease. Römer recognizes the value of zur Nedden's work but he does not consider his experiments sufficient to prove the metastatic theory absolutely. He questions N.'s conclusions that the organisms producing S. O. produce no toxins. The organisms must be capable of existing for a long time in the eye, but he questions the necessity of their possessing spore forms as zur Nedden believes. They must be cap-

able of producing chronic plastic inflammation and are therefore not to be found among the pus producing organisms. He does not agree with N. that it has been proven that various organisms may be the cause. He believes that no definite proof has been given that they cause infection of any other part of the body than the eye, and especially no case of meningitis has been proven although Leber suggests that certain clinical symptoms (headache) point to its possible presence. The cause of trachoma has likewise no effect upon any other part than the eye.

He does not agree that it is necessary for the germs to exist always in the conjunctival sac, but that they may develop outside the human organism. Finally although it has been impossible to produce sympathetic ophthalmia in animals, and it seems hopeless to expect it in experiments with rabbits, he suggests the use of monkeys. He has made two experiments, but unsuccessfully, but suggests the further use of these animals. It may prove that only one species is susceptible just as only the anthropoid apes can be inoculated with syphilis. He then gives suggestions as to the methods of making the examination of eyes causing sympathetic trouble, and of inoculating animals with the fresh material. E. A. S.

Concerning Bilateral Keratitis Parenchymatosa (Sympathetica) After Superficial Corneal Injury of One Eye.

PFALZ (Düsseldorf) Heidelberg Congress. (Ref. in *Klin. Monatsbl. f. Augenheilk.*, Sept., 1906.) In a healthy laboring man, without hereditary disease, Pfalz saw a parenchymatous keratitis follow four days after an injury of the cornea by a foreign body. The opacity spread despite inunctions with mercury and four weeks later the second eye developed the same process, and the entire cornea became opaque. After several months of treatment the peripheral part of the cornea became clear, leaving a central opacity resembling keratitis disciformis, which slowly disappeared during the course of nine months. The cornea showed no vascularity, and the only irritative symptom was the poor reaction of the iris to mydriatics, at the height of the process. In the first affected eye, secondary parenchymatous edema, due to an infectious process in the epithelium could be thought of, but in the other the condition was a true keratitis annularis. Lues and tuberculosis could not be

positively excluded but were not probable factors. Pfalz thinks that this case and those of Brommer, Czapodi, Dodd and Perlia point to the possibility of sympathetic parenchymatous keratitis in the case of traumatic parenchymatous keratitis of the other eye, perhaps with involvement of trophic nerve paths, but that the rarity of such cases makes a positive opinion impossible at present.

E. A. S.

Concerning the Action of the Ciliary Muscle Upon the Ligamentum Pectinatum In Glaucoma.

KUESEL (*Klin. Monatsbl. f. Augenheilk.*, Sept., 1906), refers to his previous paper, in which he endeavored to prove that the Brücke fibers of the ciliary muscle act unfavorably upon the filtration into the canal of Schlemm, while Müller's ring muscle and the fibers running from it to the pectinate ligament have a favorable influence, and he develops the theory in its relation to glaucoma. He believes the glaucoma attacks to be due to a sudden failure of the circular fibers of the ciliary muscle to fulfil their function in keeping open the spaces of Fontana, and compares the attack to a sudden loss of compensation in hypertrophy of the heart, which may be preceded by prodromal symptoms of partial failure. Although glaucoma usually occurs in hypermetropic eyes, with well developed Müller muscle, he explains this by the fact that such eyes have very shallow chambers and the filtration channels are only kept open by the overaction of the strong ciliary muscle; partial failures of the muscle may come, but are compensated for by stimulating the muscle with pilocarpin or eserine. The age of the individuals is a predisposing factor because the muscle is weakened in advanced life, and the same reason would explain the greater frequency of glaucoma in women than in men.

The production of glaucoma by mydriatics he would ascribe also to the paralysis of the ciliary muscle. Similarly the effects of infectious diseases, general bodily weakness, severe pain and psychic depression cause paresis of Müller's muscle. Attacks of glaucoma moreover have been shown to be favorably influenced or cut short by forced action of the muscle of accommodation as by reading fine print. When this is insufficient, myotics act, not so much by contracting the pupil as has been taught, but by stimulating the ciliary muscle, and thereby opening the filtration channels. He explains the action of

sclerotomy and iridectomy as follows: The section produces a partial tenotomy of Brücke's muscle, reduces its action upon the filtering process and at the same time allows the ciliary processes to be drawn backward. Moreover it gives Müller's fibers a better point of attachment so that their action on the pectinate ligament is strengthened.

E. A. S.

Concerning the Prognosis and Treatment of Glaucoma Simplex.

SCHLEICH (*Ref. in Die ophthalm. Klinik*, Oct. 5, 1906), reports the result in the Tübingen clinic of the operative and myotic treatment of glaucoma simplex, in cases which had been under observation more than two years. In the cases treated by iridectomy 7.8% became blind, either immediately or within a short time after operation; 76.5% showed a more or less gradual progression in the loss of function, while 15.7% only showed cessation of the process, i. e., no increase in functional disturbance for at least two years. Schleich attributed the comparatively unfavorable results to the long period of observation, some of the cases having been watched for twenty-five years.

In a much smaller number of cases (46) treated by myotics, the results were: Progression in the disease in 61%; checking of the process in 39%. Schleich believes the prognosis after operative treatment is more unfavorable in the early age than in later life. Moreover the use of myotics after operation makes it difficult to determine the value of the operative procedure. He concludes that iridectomy can not be considered in any sense a trustworthy remedy for glaucoma simplex, because in the majority of cases which are followed long enough it does not give the good results usually ascribed to it, and on the other hand in a larger percentage of cases it produces immediate harm, at times rapid blindness. He believes further that the value of the faithfully employed myotic treatment has not been as yet sufficiently tested, and the bad results depend undoubtedly partly upon a lack of thoroughness in carrying out the method.

E. A. S.

The Technic of Iridectomy for Glaucoma.

W. CZERMAK, *Prager medicin. Wochenschrift* 1906, No. 24 (*Ref. in Die ophthalm. Klinik*, Nov. 5, 1906). When the anterior chamber is very shallow, Czermak operates as follows: He cuts the conjunctiva close to the limbus, with fine pointed scissors and dissects back a flap embracing nearly one-half of

the corneal circumference, and about 4-5 mm. high at the center. After checking any slight hemorrhage with adrenalin and ice water sponges, he makes an incision with a well curved scalpel, through the sclera, 1 mm from the edge of the clear cornea, cutting through carefully layer by layer, until the anterior chamber is opened. If the iris prolapses it is replaced and the well rounded point of a fine Louis' scissors is introduced and the incision is broadened to one or both sides. The original incision needs to be only large enough to admit the scissors point, and should be slightly oblique instead of vertical, the back of the knife being inclined toward the equator of the ball. In this way the inner wound is almost exactly opposite the boundary of Descemet's membrane, and a colobomia 7-8 mm. wide can be secured. After introducing the iris forceps, they are opened wide so as to secure a broad fold of iris, the iris is grasped in the center, and first drawn gently toward the pupil, the forceps being pushed forward. This loosens the ligament and the iris is drawn outward and excised.

In cases in which the iris is adherent to the cornea, and is more or less atrophic, Czermak combines Heine's cyclodialysis with the iridetomy. Following Heine's method, he frees the attachment of the ciliary body and the adhesion of the iris with a delicate spatula, and then performs the iridectomy. He has done the combined operation in a number of cases, but is unable to make a definite report upon his results. In order to avoid seizing the ciliary body with the forceps if it prolapses into the wound, he has had constructed a forceps with protecting plates. Usually at the conclusion of the operation he passes a silk suture through the edges of the conjunctival wound and if the ciliary body prolapses he makes a superficial scleral suture.

E. A. S.

ABSTRACTS FROM ITALIAN OPHTHALMIC LITERATURE.

BY

V. L. RAIA, M. D.,
PROVIDENCE, R. I.

Saprophytes in Infections of the Eye—Critical and Experimental Remarks.

BIETTI, AMILCARE (*Annali Di Ottalmologia*, Year XXXV—Fasc. 7-8-9). As saprophytes are germs which have been considered not pathogenic, great was the interest when the first case was published of ophthalmia sympathica in which the bacillus subtilis was found. Later on the same germ was found in post operative infections in hypopion-keratitis, and conjunctivitis. This saprophyte has consequently an important bearing in infections of the eye. After these studies had been published authors began to find out what role other saprophytes could have in diseases of the eye. Perles, after experiments on the eyes of rabbits, came to the conclusion that the others were not pathogenic. Burlich, by inoculating cultures of different saprophytes in the anterior chamber and vitreous of rabbits, observed regular inflammations which he attributed to an infection due to the germs inoculated. But to obtain these results he had to use a relatively large quantity of cultures, a fact which does not happen, whatever the negligence in operative antisepsis.

Although the same author says that many post operative irido-cyclitis cases are caused by saprophytes, these have never been found in the product of inflammation and the normal conjunctiva does not show their presence, making an exception to this rule, the bacillus subtilis. Dr. Bietti has made many experiments on rabbits by inoculating cultures of different germs, imitating, as far as possible, what is liable to happen in operative infections. The saprophytes experimented upon were the following: *Sarcina lutea*, *oidium albicans*, *B. violaceus*, *B. radicumformis*, *B. megatherium*, *B. subtilis*, *B. mycoides*, *B. acidilactici*, *B. fluorescens liquefaciens*, *B. candicans*, *B. luteus*, vi-

brio proteus. The cultures of these different germs have all produced inflammations from a simple one, to a regular panophthalmitis. The irritation which followed the inoculation of *sarcina lutea*, *oidium albicans*, *B. candicans*, *B. luteus* and *vibrio proteus* were due more to the large quantity of culture inoculated in the anterior chamber and vitreous than to a real infection. Bietti excludes any pathogenic action to these five saprophytes. The others have shown a more virulent action, but even to these he excludes any marked pathogenic action.

He comes to this conclusion by observing that the staphylococcus pyogenes albus, which in cataract extractions is absolutely harmless, inoculated in the eyes of rabbits produces iritis, with seclutio and occlutio of the pupil, and even a more severe inflammation than that caused by those saprophytes experimented upon. In consequence of his investigations Bietti does not entirely agree with Ulbrich, according to whom a part at least of the post-operative infections are due to these saprophytes. Therefore to attribute a pathogenic action to some of these germs, when these have been found neither in the normal nor in the abnormal eyes and the clinical observation has not yet shown that they possess such a property, is to affirm facts which possess no positive proof.

V. L. R.

Trachoma in the Pathology of the Lacrimal Canal.

DR. BASSO (*Annali di ottalmologia* 7-8-9, 1906). The pathogenesis of the chronic inflammations of the lacrimal canal has received great impulse since the radical cure has been adopted, and especially after its extirpation in toto as recommended by Dr. Basso. Previous to this, uncertain ideas prevailed on the subject. Trachoma had been hinted by some authors, but the assertion that the disease is rather prevalent was first made by Basso, who has had the opportunity to study microscopically several lacrimal canals extirpated with this method. He has observed that granulations of the same nature of the commonly seen trachoma are present in the altered conjunctiva, an alteration very different from the chronic inflammations of the lacrimal duct. This trachomatous condition is either secondary to a similar affection of the conjunctiva or primary. The author considers the lacrimal sac with the accumulation of tears a proper field for the growth of the germs which are the cause of trachoma. He even thinks that the primary trachoma

here is more frequent than what we are accustomed to call under this name, as the tears not only wash away from the conjunctiva the pathogenic germs, but stop somehow their growth by the known germicidal property they possess.

Joers, Hertel and Tartuferi had been impressed by finding in their microscopical researches numerous follicles on the surface of the diseased mucosa in dacryocystitis, but all of them denied a trachomatous nature to these neoplasies. Only Cirincione in his treatise of the pathology of the lacrimal apparatus gives a great importance to trachoma either acute or chronic in alterations of the lacrimal duct.

Chronic inflammation differs from trachomatous alteration of the lacrimal duct, besides by the absence of these follicles, by a remarkable hyperplasy of the connective tissue, which in the cicatricial stage produces occlusion of the nasal canal in the trachomatous variety. In the other form instead, the inflammatory, prevails dilatation of the sac, and less frequently the occlusion of the nasal canal is observed. In regard to the diagnosis of primary trachoma Dr. Basso thinks very important the symptom of hardness of the sac, a sensation which persists even after the same has been emptied. The trachomatous character of many affections of the lacrimal apparatus explains the long period of latency of the same, a period which corresponds to the slow evolution of trachoma, and its tenacity to all resolute treatments. It is in consequence of this and the frequency of the malady that the conservative treatment will be more and more abandoned and, according to the author, the extirpation of the sac more appreciated in the future.

V. L. R.

Results of Some Plastic Operations.

DE BERARDINIS, D (*Annali Di Ottalmologia*, 10-11, 1906). The author reports thirteen cases of plastic operations of the lids with splendid results, and in all these only twice he used pedunculated flaps borrowed from the neighboring tissues, for the others having adopted the dermo-epidermic flaps taken from the arm. De Berardinis, who has had a large experience on this subject, is an enthusiast for the last process, which proves successful if properly executed. He recommends the following precautions:

1. Loosen freely the cicatricial tissues and remove the same.

2. Make a permanent tarsorrhaphy.
3. Remove a flap twice as large as the loss of substance to be covered.
4. Accurately deprive the flap of all the adipose tissue and render the same as thin as possible.
5. Undermine the margin of the wound, and suture thereto the edges of the flaps.
6. Exercise on the middle of the flap a certain pressure by means of a roll made of a long strip of gauze on which a larger one is applied surpassing the margins of the flap.
7. Bandage both eyes for five days.
8. A uniform pressure of the flap must be kept for many days, even after the graft is well insured.

With these precautions the author has never seen a case of necrosis of the flap, of insufficiency and the so much dreaded folding of the same. Having kept under observation many of his patients for several months he has had the satisfaction to see that no alterations had taken place from the first good results.

V. L. R.

Ulcus Rodens of the Cornea Cured by Means of Heteroplasty of Corneal Tissue of Rabbit.

DE BERARDINIS. (*Annali Di Ottalmologia*, 10-11, 1906). This affection which was confounded with serpiginous ulcer before Morean had made the first accurate description of it, begins at the periphery of the cornea and progresses toward the center. Nothing has been found useful to arrest the same, the inevitable result being a diffuse leucoma with the loss of sight. Some think it dependent upon a special germ, although nothing sure can be said on this point, others think that general denutrition by altering the trophism of the cornea produces and maintains this destructive process. De Barardinis considers the affection rather specific, although in his case the patient enjoyed the best of health. Having had under observation a typical case of *ulcus rodens*, and having tried all the known treatment without avail he had recourse as a last resource to the transplantation of a large piece of the cornea of a rabbit with previous excision of the diseased parts of the cornea. With great surprise he observed that the results could not have been better, the destructive process not only being arrested, but all the membrane becoming transparent.

V. L. R.

**Contribution to the Diagnosis and Treatment of Exophthalmos
Caused by Ethmoidal Mucocoele.**

PROF. CIRINCIONE (*Clinica Oculistica*, January, 1907). The four pneumatic cavities, the maxillary, the frontal, the ethmoidal, the sphenoidal by retention of mucus in catarrhal inflammations are liable to enlarge and become regular cystic cavities. This condition is brought about by the occlusion of the foramen which puts these cavities in communication with the nasal meati. This occlusion may be produced by mucous secretion, by cicatricial tissue and by tumors, and when it takes place the accumulation of mucus dilates the least resistant wall of the cavity. Thus the cystic formation shows itself in the orbit, in different regions of the same, a fact which constitutes an important factor in the diagnosis of these mucocoeles, in regard to the starting point of the same. In mucocoele of the frontal sinus the tumor shows itself under the head of the eyebrow; on the lower floor of the orbit, when it starts in the antrum of Highmore, pushing the eye-globe upward; on the internal wall of the orbit when the starting point is the ethmoidal sinus. This latter is of two varieties, anterior and posterior, and in both varieties the eye is pushed externally and forward. To distinguish ethmoidal mucocoeles from other tumors of the orbit is a very difficult task. The sphenoidal variety on the other hand requires all the clinical considerations at our disposal, the location and the development being not always constant. In regard to the treatment the author has observed that the simple incision of the wall of the cystic formation is not sufficient, the tumor returning sooner or later by reaccumulation of exudates in its cavity. To prevent this the writer does not open the natural outlet of the different sinuses, but on the most convenient part cuts a large piece of the bony wall separating it from the nasal chambers, thus draining the cyst of its contents through the nostrils.

V. L. R.

On the Transmissibility of Trachoma From Man to Monkeys.

PROF. P. BAJARDI (*La Clinica Oculistica*, Year VIII—January, 1907). That trachoma is a contagious disease every one knows, but to what germ it is due, we are not yet in position to know. Rahelmann, after many experiments, came to the following conclusions in regard to the pathogenesis:

1. In the trachomatous secretion there are always to be seen some bacteria which are most active at a temperature of the body.

2. Constantly in the same secretion are observed protoplasmic particles movable and active.

3. Besides the above forms, the author has seen under the microscope very minute spherical bodies of yellow or gray color. Which of these constitutes the agent of the contagium cannot be determined; so that these experiments left the pathogenesis of the trachoma unsolved.

The researches of Hess and Romer have proved beyond doubt that trachoma can be communicated to monkeys by inoculation or by rubbing the human conjunctiva affected with the disease on the conjunctiva of these animals. Bajardi without the least knowledge of these studies experimented on four monkeys and has come to the same conclusion. He has reproduced granular formations by inoculation, by instillation, and by grafting small pieces of diseased conjunctiva, and the course of the neoformations, and their appearance have shown course of the neoformations and their appearance have showed all the characteristics of true trachoma. Now that at last it has been found that monkeys are liable to the infection our author thinks that by experimenting on these animals, the real pathogenic germ will be in a short time discovered, and later a rational treatment will be found.

V. L. R.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of May 13, 1907. Dr. F. C. Hotz, President.

Retinitis, Probably Due to Cerebellar Tumor.

Dr. H. B. Young, Burlington, Iowa, made a further report on a case of retinitis probably due to cerebellar tumor treated by tuberculin.

Unilateral Vernal Conjunctivitis.

Dr. Casey A. Wood read a paper on vernal catarrh, exhibiting a case of unilateral vernal conjunctivitis, and microscopic specimens of tissue removed. The patient was a healthy girl of 11, with a marked ptosis of the left side. Almost the entire conjunctival surface is seen, on eversion of the lid, to be occupied by irregular, roughly polygonal, partly pedunculated, flat-topped masses of hardened tissue, distinctly separated by sulci which extend to the altered conjunctiva beneath, being in some instances 2 mm. deep. There were no notes on the bulbar conjunctiva, although the upper sixth of the cornea was invaded by a number of new vessels which simulate to some extent the vascular pannus of trachoma. The right eye shows nothing to indicate the ravages of a past or present spring catarrh. Two months ago the cartilage-like masses were abscised, under general anesthesia, and their bases curetted. The pathologist's report showed a chronic hyperplasia of the epithelium and underlying connective tissue; the stroma is full of bundles of wavy, elastic fibers permeating the entire connective tissue structure. A great many eosinophiles were present. Improvement followed the employment of the X-rays and topical applications.

Vernal Catarrh.

Dr. F. A. Philips presented a case of palpebral vernal catarrh upon which a complete tarsectomy had been done by Dr. Beard upon one eye, and a partial one upon the other, after all the usual methods of treatment had been employed. The operation had been attended by improvement. Dr. Phillips did not feel that the case was cured, but the patient had been comfortable for the past year.

Dr. E. V. L. Brown sectioned the tissue removed and found a typical proliferation of elastic tissue in large bundles forming the main bulk of the tarsal granules.

Hernia Cerebri.

Dr. Mortimer Frank exhibited a boy, 13 years⁸ old, who had a congenital hernia cerebri. There was absence of the brow and of the cilia down to the medium fissure, and the upper wall of the orbit was away back. The fundus was normal, except for enlarged veins, both superior and inferior. Vision was 6/60, probably due to an astigmatic cornea.

Conservation of Sympathetic Nerves in Enucleation.

Dr. George F. Suker read a paper on sympathetic nerves in relation to enucleations, and presented a case. When an eye is to be enucleated, the best possible cosmetic effect should be secured. Usually the connection of the nerve fibers passing to the lids is severed and destroyed, and there ensues a traumatic, sympathetic process, which is unsightly. In the past four or five years he has been very careful not to sever or interfere with the lenticular ganglion, so as to preserve the continuation of the nerve fibers of the lids. Since he has been doing that he has avoided subsequent drooping of the lids, as was shown by the patient exhibited. In most of the enucleations done prior to that time the lids drooped, and in the case of those that escaped he took it for granted that the nerve fibers were not interfered with during the operation.

Dissociated Nystagmus.

Dr. Willis O. Nance exhibited a case in a seventeen-months' old child. The tremulous movements of the left eye were rapid, while those of the right were scarcely noticeable; in fact, when the eyes were turned to the extreme right no movement in this eye was perceptible. The movement of the eyes also differed as to direction, in that those of the left were at times horizontal, and at other times the eye moved in an oblique axis; the movements of the right were rotary. There was no muscular anomaly present, the ocular media were clear and there was no history of brain disease. The patient had a rather high degree of hypermetropic astigmatism with an oblique axis. The mother stated that the left eye began to

"twitch" when the patient was one and one-half months old, and has continued since, while the right eye was perfectly quiet until six months ago, when she first noticed a tremulous movement.

Nance prescribed atropin four weeks ago when he first saw the case, and since that time there has been some diminution in the movements of the eyes. This leads him to believe that a correction of the refractive error may materially assist in the cure.

Typical Limbus Dermoid.

Dr. Nance also exhibited a young man of 20 who had a typical limbus dermoid situated at the temporal aspect of the right eye. A number of coarse black hairs could be seen on the growth. The eye on which the growth was present was highly myopic, and there was a marked degree of astigmatism present; the other eye was slightly hypermetropic. There were a number of opacities demonstrable in the lens; no other changes were discovered. The patient refused to have the growth removed.

Entropion with Corneal Ulcer Consecutive to a Zoster Ophthalmos.

Dr. F. A. Phillips exhibited a patient demonstrating this condition. The patient first appeared January 25th, when he complained of an inflammation of the eye, which an inspection proved to be a corneal ulcer with shallow edges. There was a cicatricial entropion and anesthesia of the cornea. A year before he had been violently ill with the zoster ophthalmos, and then there appeared the corneal ulcer, probably the result of the anesthesia of the cornea, and then the entropion. On the third day of his illness he became delirious, and remained so for the greater part of five months. He then began to improve, and by the seventh month the zoster had healed. The eye remained sore the entire time, so that it is a question whether the cornea was involved at the time of the zoster. The ulcer was healed, and the cornea is being protected from the falling of foreign bodies on it, which served to prolong the ulceration. The patient was presented, previous to operative procedure, so that the improvement which it was hoped to get could be noted.

E. V. L. BROWN, M. D., *Secretary.*

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of March 16, 1907. Dr. David B. Strickler, presiding.

Fistula Following Panas' Operation for Ptosis.

Dr. David H. Coover, Denver, presented a man, aged 35, who had been operated on in Königsberg, Germany, seventeen years before, for ptosis of upper lid, with resulting ability to elevate the lids to the horizontal plane. A Panas operation had been done on the right; and a fistula, lined with epithelium, had developed where the tongue of skin had been drawn up under the bridge of tissue dissected up from the eyebrow. The fistula was Y-shaped, two openings above and one below, and a probe 2mm. in diameter could be passed its entire length. On the left an elliptical piece had been removed with success.

Absorption of Lens After Dissection in Adult.

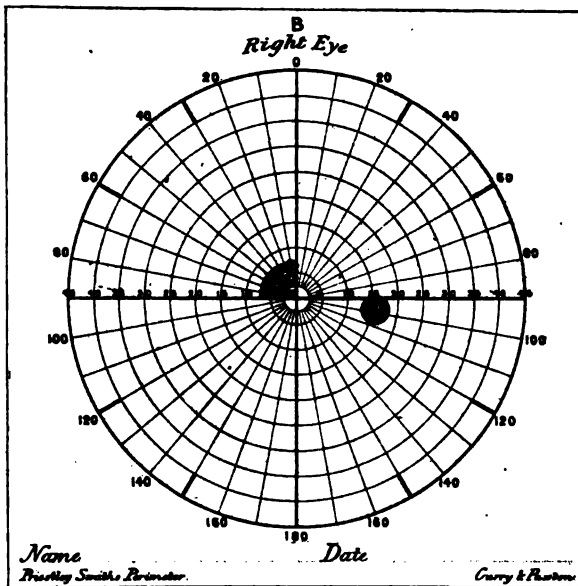
Dr. G. F. Libby, Denver, exhibited the case of traumatic cataract shown by him at the October meeting of this Society. On Dec. 3, 1906, a broad horizontal dissection had been made through both capsules. The mushy lens matter which gushed out and covered the lower third of the iris and filled two-thirds of the pupil caused only a moderate iritis, easily controlled by atropin. A week later instillations of 5 per cent dionin every two days commenced and continued for four weeks; then followed the use of a 2 per cent solution every three days for three weeks. Examination on Jan. 7, 1907, showed that all lenticular cortex and one-third of the capsule had been absorbed. V=4/8 cum plus 13.00 sph., and ability to read type 1.00 cum plus 18.00 sph. When shown before the Society at this meeting, vision for near and distance was normal with above lenses, the pupil was black, the iris reacted properly to light and consensually, and only a very narrow peripheral ring of capsule remained.

Retino-Choroiditis with Central Scotoma.

Dr. W. C. Bane, of Denver, showed M. J. T., aged 24, medical student, with a scotoma in the right eye. Ten days before (March 6, 1907), while the patient had been looking far up-

ward and to the right, there suddenly developed a blurring of vision with the right eye, that remained, though gradually disappearing. The dimness interfered with close work.

Vision was 5/6 with each eye. The test with the perimeter revealed a distinct scotoma, limited to the upper-inner nasal quadrant of the field and extending but 7° from the point of



fixation. There was a slightly mottled appearance in the fundus 1mm. outward and downward from the macula. The patient was advised to rest the eyes and take potass. iodid in increasing doses. There was no specific history. On March 9 the haze continued. V=5/10. On March 12 a clearing of the dim area was noticeable, so that the object was readily outlined through it. On March 16 the patient stated that he was able to see more clearly through the dim area. Vision=5/6. The chart indicates the size of the scotoma.

Traumatic Cataract.

Dr. E. R. Neepier reported a case of traumatic cataract in a man of 37, a blow from a twig having caused rupture of the anterior capsule. The eye had become fairly quiet in ten days, when a broad dissection was made. Following instillations

of dionin daily for five months, absorption of the cortex was complete and useful vision resulted.

Interstitial Keratitis.

He also reported a child of 7 years suffering from severe interstitial keratitis, with dense "salmon patch" in one eye, the other being similiary but less affected. K. I. had been given, with disturbance of appetite and no benefit, but syrup hydriodic acid was well tolerated and beneficial. Therapeutic suggestions were requested.

Discussion.—Dr. Jackson advised mercury or the salicylates.

Dr. Strickler suggested cod liver oil

Dr. Libby advocated the addition of calomel to the daily treatment with hydriodic acid constitutionally, and to the atropia locally would add the use of 1 or 2 per cent dionin tentatively. He said that J. Hutchinson had characterized the salmon patches in the cornea in this disease as pathognomonic of inherited syphilis.

Other Cases in Brief.

Dr. Neeper reported the removal of a piece of steel $\frac{1}{4}$ by $1\frac{1}{2}$ mm., by Dr. Patterson and himself with an electro-magnet at an electric power house, the only place that the current could be secured by them.

Dr. Jackson reported a case of neurasthenia with 4 D. of hyperopia and 1.50 D. of astigmatism treated by the rest cure in the German Black Forest, with no suggestion as to an ophthalmic examination.

Dr. Bane reported the use of 12° prism effect for divergent squint, with comfort; and Dr. Jackson 20° total for distance and 30° for near in this condition, and 12° for vertical squint, although he had rarely given over 3° up and down for the latter error.

Dr. Libby reported the death of two cases of chronic interstitial nephritis with retinitis albuminurica, one a woman of twenty-eight and the other a man of twenty-six, shown by him before the Society at the April and November, 1906, meetings, respectively.

The young woman's renal condition had been suspected by her physician for five years, but positively known for only about one year, while the known ocular disturbance had been

of only three months' standing, when first seen late in March, 1906.

In the young man's case the renal and ocular condition had been manifest only six weeks before his first examination in September, 1906.

Both patients died in December, 1906.

The Astigmatic Lens in the Determination of the Amount, and Principal Meridian of Astigmatia.

Dr. Edward Jackson read a paper on this subject, in which he pointed out the great advantage of the so-called crossed cylinders in ascertaining the strength of cylinder required for an astigmatic eye; the advantage lying in the suddenness with which, by easily and quickly rotating the crossed cylinder, the cylindrical effect is increased or decreased by 0.25, 0.50 or 1.00 D. He also indicated the help obtained in learning the axis of the cylinder required, by placing one axis of the crossed cylinder 45° from the axis of the cylinder which has been found approximately correct, and quickly reversing the axis of the crossed cylinder to 45° from the axis of the trial frame cylinder, in the opposite direction. Accordingly, the axis of the cylinder is turned in the trial frame in the direction indicated; and the process is repeated. Here also the suddenness of the change constitutes the advantage of the method over the usual one of revolving the cylinder in the trial frame.

The Society passed a vote of thanks to Dr. Jackson for his paper and the demonstration of his methods of using the astigmatic lens.

Meeting of April 20th, 1907, in Denver. Dr. Melville Black, presiding.

Traumatic Dislocated Lens and Foreign Body (?) In Eye.

Dr. D. H. Coover, of Denver, showed a man of forty, who had been injured in an explosion, November, 1906, one eye being totally destroyed.

The other presented multiple corneal scars; opaque lens, dislocated upward, and adherent to the iris; slightly increased tension, and V=light preception in lower field. Dr. Coover thought it probable that the eye contained a foreign body, either in the lens or the vitreous.

Discussion.—Dr. Neepor would use dionin locally unless the X-rays showed a foreign body. He spoke of a case of linear

haziness caused by a splinter of steel passing the lens, in which the opacity disappeared under dionin applications.

Dr. Strickler would needle rather than extract the lens if the X-rays revealed a foreign body elsewhere than in the lens.

Dr. Jackson advised dionin to promote absorption of the lens, which, however, he thought of very doubtful efficacy in this case.

The operation of choice would be an incision in the superior temporal quadrant, extraction with a loop, and central iridectomy.

Dr. Bane suggested discission with a Graefe knife, keeping the corneal wound open for a few days to reduce tension.

Crescentic Corneal Opacity.

Dr. D. B. Strickler, of Denver, presented a woman of thirty-two, with a crescent of corneal opacity near the outer limbus. Four months previous she had shown episcleritis at the inner corneal limbus of the same eye, which yielded to yellow ointment followed by hot applications and dionin.

Discussion.—Dr. Neeper advocated K. I. in small doses, for episcleritis; and Dr. Bane, 5% cinnamate of soda injections, on the ground of tubercular causation.

Binocular Vitreous Hemorrhage.

Dr. Melville Black, of Denver, presented a man, aged 26, who had been under his observation for 19 months. During that time he had two hemorrhages into the vitreous of the left eye at an interval of 11 months.

This eye recovered with normal vision, but with considerable retinal scarring. Recently a hemorrhage into the vitreous of the right eye had occurred. At the first hemorrhage there was a blood pressure of 165 mm. with a heart normal in size, and marked indicanuria.

The treatment given was directed toward lowering the blood pressure and correcting intestinal decomposition. The first two vitreous hemorrhages rapidly cleared. When the vitreous hemorrhage appeared in the right eye the conditions were reversed; his blood pressure was low, 115 mm., and his heart was found to be stretched to the extent of the apex being to the right of the sternum. He had no evidence of intestinal decomposition.

This hemorrhage was ascribed to passive congestion; and strophanthus and nux vomica were prescribed. His recovery was rather slow, but there were no setbacks. The last hemorrhage was in the eye which had heretofore been normal. His heart was found to be considerably dilated. The apex was found to extend from $\frac{1}{2}$ inch to left of nipple in 6th interspace to right side of sternum $1\frac{1}{4}$ inches. Blood pressure 132. He had marked indicanuria. Dr. E. C. Hill decided that the hemorrhage was due to passive congestion from the dilated heart, and gave strophanthus and nux; also sodii sulphocarbolate for the intestinal fermentation.

Discussion.—Dr. E. C. Hill said that enlarged heart was next as common as nasal catarrh, that Chicago reported four times as many deaths from enlarged heart as from valvular lesions; and considered the most difficult cases to be those of enlarged right ventricle, with passive congestion.

Double Optic Atrophy, with Tabes.

Dr. G. F. Libby, of Denver, showed a man of forty with a history of syphilitic infection 18 years previous, excessive use of alcohol and tobacco until 3 years before, and severe injuries to one hip, the symphysis pubis and the upper jaw, in a railway wreck in 1903. He had first discovered the vision of the left eye to be lowered six years ago.

In January, 1907, he presented himself for examination, stating that his sight had failed in the past three months, the left being more progressive R. V.= $\frac{4}{5}$, L. V.= $\frac{1}{45}$. L. pupil dilated, reacting feebly to light and consensually. Both pupils reacted to convergence. Right knee reflex increased, left decreased; tabetic gait. Accommodation, right=5. D. The disks showed white atrophy. The treatment consisted in Hg. Bichl. gr. $\frac{1}{120}$ to $\frac{1}{40}$ t.i.d., K. I. gr. 5 to 75 t.i.d., Strych. Sulph. gr. $\frac{1}{60}$ to $\frac{1}{8}$ t.i.d.

After one month's treatment the vision remained unchanged, or possibly slightly improved. In the next two months it gradually fell to R. V.= $\frac{4}{22}$ partly, L. V.=light preception.

Discussion.—Dr. Black advised hypodermic injections of hydrag. salicylate. Drs. Stevens and Coover would push strychnia hypodermically; the former giving it in the temples, the latter using the nitrate. Dr. Neeper considered the prognosis bad, as did all present, but would push the iodid of potash

and mercury; especially the latter. Dr. Jackson advocated occasional use of calomel for a few days until the bowels were well acted upon, to guard against auto-intoxication; and the use of strychnia hypodermically to the point of toleration.

Neuro Retinitis with Arterio-Sclerosis.

Dr. Black reported a woman who came to him January 19, complaining of general diffused pain in her head, also a central blind spot in the right eye. Her vision was R.=20/40 L.=20/20. The ophthalmoscope showed right neuro-retinitis, with hemorrhages and spots of retinal degeneration.

The left eye was found to be in the incipient stage of the same condition. She was referred to Dr. E. C. Hill for examination, who reported blood pressure of 240 mm., large quantity of albumin and granular casts.

She made steady improvement under Dr. Hill's management, with complete restoration of vision and very marked improvement in the neuro-retinitis.

This case illustrated how a very high blood pressure may be responsible for the headache and ocular complications in chronic Bright's, and how sharp the improvement may be when the blood pressure is reduced.

This case also illustrated ophthalmoscopically the changes in the vessel walls, showing the "bendings" at the crossings, as well as the opaque vessel walls, also the increased size of the veins prior to their being crossed by arteries.

(?) Albuminuria of Pregnancy; Death.

Dr. J. R. Robinson, Colorado Springs, reported intense neck pains and sudden blindness in a woman of twenty-five, who was 6½ months pregnant.

The attending family physician reported the urine to be "loaded with albumin." Abortion was advised, but refused. Then thorough catharsis was employed, resulting in restoration of vision. Two weeks later coma supervened, lasting half a day, when death occurred. The media and fundus were not examined.

Discussion.—Dr. E. C. Hill said that the fall of urea was more important than the amount of albumin, and that eclampsia occurred without albuminuria. He would investigate the liver and the amount of urea. Dr. Black thought that enlarged

heart, raised blood pressure and indicanuria were conditions of paramount importance in relation to intra-ocular disturbances. Dr. Jackson spoke of the limited area, of varying locality, usually affected in arterio-sclerosis.

Dr. E. W. Stevens said that toxemia of pregnancy is one of the most important problems in medicine to-day. The modern conception of this subject makes it responsible for eclampsia and the pernicious nausea and vomiting of pregnancy. The presence or absence of albumin in the urine is now regarded as of secondary importance. The best knowledge to-day leads obstetricians to believe that the toxemia of pregnancy is not essentially of nephritic origin. The blood serum in these cases has been found to be the toxic agent. It will cause death of animals, with convulsions, and characteristic changes in the important organs. Modern investigation has shown that the kidneys are but slightly responsible, while the liver is the organ most frequently diseased. The lesions of the liver are much like those of acute yellow atrophy. The nature of the poison which produces toxemia and eclampsia is entirely unknown, its presence in the blood is indicated by headache, unusual mental conditions, altered secretion and excretion, and disturbance in the sensory apparatus. To the ophthalmologist the most important sensory disturbance was the affection of the sight, which varies in different cases from slight failure of vision to complete blindness. The ophthalmoscopic examination may show a normal fundus, the blindness being cortical; or, on the other hand, there may be all the eye ground changes of renal retinitis. It was important for the ophthalmologist to bear in mind that neither the disturbance of vision nor the retinal changes were essentially of renal origin, but were in many cases due to a toxemia of pregnancy, the nature of which is at present unknown.

Calcareous Bands in Cornea.

Dr. Jackson reported a primary horizontal calcareous band extending across each cornea and the width of the palpebral opening, in an adult woman. V.=4/45 each eye. Corneal reflex perfect. Under holocain the bands were curetted, the central portion coming off easily, the peripheral with more difficulty. No staining by fluorescein after 24 hours.

Bowman's membrane only was the seat of the deposit. Ultimate vision: R.=4/12 L.=4/9 partly.

Discussion.—Dr. W. L. Hess reported a similar case with a vertical band $1\frac{1}{2}$ mm. wide extending across the cornea, in a man of 65, stating that he scraped it off with resulting V.=6/8.

Dionin in Pterygium.

Dr. Coover reported the use of dionin, 4 or 5% solution, before and after six operations for pterygium, showing marked absorption of the growth; making the operation less difficult and the after-treatment and result more satisfactory.

Glioma, Sarcoma, or Retinal Detachment.

A child of four years, who had pertussis with convulsions at two, after which one eye diverged, was also reported by Dr. Coover. Recently he had noticed a yellowish gray floating mass behind the lens, with fine cholesterin bodies in the retina, in the same eye. No pain. Ophthalmoscopic and oblique examination showed a floating retina on the nasal side.

The optic nerve was invisible, T.=plus 1, which was lowered on using a mydriatic. Cornea and conjunctiva normal.

Discussion.—Dr. Jackson thought cholesterin argued against a new growth, and that there probably was an old retinal detachment, with cystic degeneration. He advised examination by transillumination.

Election of Officers.

Dr. G. F. Liby was re-elected Secretary and Dr. Melville Black Treasurer. Dr. D. B. Strickler was elected Chairman of the Executive Committee.

Secretary's Report for the Year ending April 27th, 1907.

One active member has been added during the past year, making the total membership one honorary and twenty-one active members.

Seven stated meetings have been held, with an attendance of ninety-one, or 63 per cent; and twenty-two visitors. Three members have attended every meeting. Two assigned subjects have been discussed with interest.

Six papers have been contributed by members, twenty-eight cases shown, forty-nine cases reported, and sixty-four took part in discussions.

Resolutions were passed and forwarded to the Colorado General Assembly, indorsing two bills; one for the construction and maintenance of an institution for the adult blind of Colorado, for industrial training, the other a bill for revision of the School Laws for the purpose of securing the recognition and correction of physical defects in children.

On invitation of the Western Section of the American Laryngological Rhinological and Otological Society, the Colorado Ophthalmological and the Colorado Oto-Laryngological Societies met on February 16th, 1907, in joint session with the national society, at the Denver Academy of Medicine.

The ophthalmological papers by members of this Society related to the connection between the eye and nose in certain pathological processes.

GEORGE F. LIBBY, M. D., *Secretary.*

BOOK REVIEWS.

Die Bakteriologie In Der Augenhellkunde.

BY THEODOR AXENFELD,, Professor of Ophthalmology in Freiburg. Eighty-seven illustrations in the text (some colored), three colored Charts, and a table for differential diagnosis. Published by Gustav Fischer, Jena, January, 1907.

Professor Axenfeld's book on bacteriology in ophthalmology, which he has gracefully dedicated to his French colleague, Dr. Victor Morax, is a book of 351 pages, crowded with facts upon the subject, that should be in every ophthalmologist's library. His personal investigations, evidenced by the numerous contributions from his pen, and from those of his students, make him an authority upon the subject. There is no work of this character which compares with it in completeness, and it will probably remain the standard for consultation. It is an enlargement of his article on the bacteriology of the eye, to be found in Wassermann and Kolle's "*Handbuch der pathogenen Mikroorganismen*," which appeared in 1903. In this, however, only the peculiarities of the organisms which were special to the eye were treated, whilst the present book includes, in addition, the biological description of all the bacteria which affect the eye, without going into full details upon bacteriological technique. These, he assumes, are familiar to the ophthalmologist, or, can be obtained from general works on bacteriology.

Chapters have also been introduced upon the normal conjunctival sac, the bacteriological foundation of asepsis and wound infections, diseases of the eyelids and orbit, endogenous infections of the eye, and upon syphilis, tuberculosis, and leprosy of the eye. At the end of the book three colored charts are given, illustrating the common organisms, and a condensed table showing the cultural peculiarities of twenty-five varieties, for convenience in differential diagnosis. The literature has been brought up to 1907.

Prof. Axenfeld holds firmly to his frequently expressed belief that surgeons who have sufficient experience in the examina-

tion of smears stained by the Gram method, will give up a skeptical attitude concerning the value of bacteriological examinations in their routine clinical work, and that the surgeon who neglects these examinations is not treating his patients with the best possible skill.

The chapters on serum-therapy and serum diagnosis are especially timely in assisting the ophthalmologist to grasp this rather complicated subject. Concerning the treatment of serpigenous ulcer of the cornea by pneumococcus serum, after reviewing two hundred cases, he says that the prophylactic treatment of corneal injuries in unclean surroundings, with Römers serum, combined with sterilized cultures, is to be recommended. In ulcers the use of the serum therapy alone is justified only in the first stages of the milder cases, but is never to be relied upon. More severe cases should be cauterized at once, in the first stage, and the results will be better if the serum is used in addition. This is in agreement with the results reported by Professor Hess at the recent meeting of the American Medical Association at Atlantic City.

EDWARD A. SHUMWAY.

Human Anatomy.

Edited by GEORGE A. PIERSOL, M. D., Professor of Anatomy in the University of Pennsylvania. Published by the J. B. Lippincott Company, Philadelphia and London. Price, cloth, \$7.50.

This work of more than 2,000 pages enjoys the distinction in its class of being an entirely American production. It has been under preparation for a number of years, and must appeal to all members of the medical and allied professions, irrespective of school or specialty, for Anatomy and Physiology are foundations from which all of us must start, and to which we must many times return.

The authors, five in number, represent Anatomy as taught in four of our foremost universities. They are Thomas Dwight, of Harvard; J. Playfair McMurrich, of the University of Michigan; Carl A. Hamann, of Western Reserve University; and Geo. A. Piersol, and J. William White, of the University of Pennsylvania. Of the seventeen hundred and thirty-four illustrations, fifteen hundred and twenty-two are original, and

largely from dissections made by John C. Heisler, M. D., Professor of Anatomy in the Medico-Chirurgical College, Philadelphia.

The illustrations are remarkable for their accuracy and artistic effect, and for the clearness and distinctness with which every part and structure is brought out and differentiated. The descriptive names are not crowded, and the leaders run unerringly to the points intended. The numerous water color records, translations, drawings and subsequent art processes, are the work of Messrs. Hermann Faber, Ludwig E. Faber, Erwin F. Faber, J. H. Emerton and Louis Schmidt; all of whom are familiar to those interested in the artistic side of medical literature.

Under the name of *Practical Considerations*, Dr. J. William White has contributed greatly to the value and usefulness of the book by pointing out the relations of anatomy to the requirements of the practitioner, and by associating with anatomical facts, certain conditions resulting from injury or disease. These practical considerations follow throughout, the description of each organ or system, and, as the Editor says, help to awaken interest, and to combat the tendency to regard Anatomy as something to be memorized during student days and forgotten when examinations are over.

The reader will doubtless be pleased to find that the Editor has retained for the most part the terminology in use by English-speaking Anatomists and Surgeons; the B. N. A. synonyms as adopted a few years ago by the Basale Congress, are however, also given in special type reserved for the purpose.

As a book of reference this work has not been surpassed, and is not likely to be for some time to come, but as a text book it has one objection which few American publishers seem willing to correct. The reviewer has always protested against the binding of a thousand or more pages in a single volume, and is convinced that a book is of greater use, and is more often referred to, when the reader can carry it with him, than when he must anchor himself to it for consultation. The publishers have, with this exception (based in this case upon a personal opinion), produced a book which might well be considered mechanically perfect. It would be difficult to conceive of better paper, printing and binding in a book of this kind, the

workmanship throughout reaching the highest standard of excellence known to the art of book making.

WM. T. SHOEMAKER.

The Ophthalmic Year Book.

EDWARD JACKSON, A. M., M. D., and GEORGE E. DE SCHWEINITZ, A. M., M. D., assisted by THEO. B. SCHNEIDEMAN, A. M., M. D. Published by the Herrick Book and Stationery Company, Denver, Colorado, 1907.

The fourth volume of this valuable contribution, which the authors have annually presented, and which those interested in the literature of Ophthalmology anxiously await, well fulfils the purposes of the work as set forth in the preface, namely, *to render the best current literature available to all who practice Ophthalmic Medicine and Surgery, as well as to furnish bibliographical aid to the thorough student.*

The difficulties encountered by the editors can well be realized when we consider that 13,550 pages from journals devoted especially to Ophthalmology have come regularly to their attention from English, German and French sources alone, and out of the 1,500 reference to journal articles in the present volume, twenty-six per cent are to articles that do not appear in journals devoted especially to Ophthalmology, but are taken from the hundreds of thousands of pages, published last year in the general medical journals of the world.

The number of pages in books and monographs listed, aggregates over thirty thousand.

For the busy Ophthalmologist to keep in touch with the best literature in his line from the world around, would, without such a work as here presented, be well nigh impossible.

It has not been the intention of the editors to catalogue *all* contributions to Ophthalmic Science appearing during the past year, but to note with sufficient reference, the *best* only, and in passing judgment on the material above referred to, much, of course, had to be omitted.

A useful addition to the present volume is a list of short biographical sketches of Ophthalmologists who have died during the year. The names of many have been landmarks in the growth and progress of Ophthalmology, and some knowledge of their personalities cannot help but be of interest.

So familiar do we become with certain names associated with Ophthalmology, that we frequently handle them carelessly for months, or even years, after their owners have passed on. It is quite important, therefore, to keep the ever-increasing necrology in mind lest embarrassing mistakes be made.

WILLIAM T. SHOEMAKER.

NEWS AND NOTES..

F. A. MORRISON, M. D., of Indianapolis, has had two cases brought to his attention in which intra-ocular changes followed immediately the injection of cocain into the gums.

Case I. A farmer, aged thirty-five, consulted me last October for progressive loss of vision, and gave the following history. He had always been healthy and vision was perfect. Wishing a lower left molar tooth extracted, he permitted the injection of cocain into the gum in the neighborhood of the tooth. Almost immediately upon the completion of the operation he felt faint and breathless, and shortly became unconscious, requiring the services of a physician. Under stimulants he revived sufficiently in about an hour to get into his buggy and start for home. He found he could not drive because, as he expressed it, "things seemed mixed up." He was not conscious of any loss of vision at this time, but attributed his trouble to incomplete recovery from his previous collapse. Next morning he noticed the vision of the left eye was dim, but eye painless. This increased for one week, when he came under my care. The eye was neither red nor painful, nor could pain be produced by ordinary palpation; the pupil was moderately dilated, tension was normal or questionably minus, and the aqueous and vitreous were full of dustlike opacities, some of which had become precipitated upon the cornea and the anterior surface of the lens capsule. The fundus was too dimly visible to make the ophthalmoscopic findings certain, but seemed normal. Vision was reduced to fingers at two feet. He persisted in the statement that the vision was perfect up to the time of the injection, and offered as corroborative evidence the fact that he had engaged in rifle shooting a few days previous, and had used the diseased eye for aiming. Two weeks later the eye was in the same condition, at which time he passed from under observation and his subsequent history is unknown.

Case II. Three weeks since a lady aged twenty-two consulted me, giving the following history. Up to within one month vision had been perfect. On this point she was certain,

stating that her duties (those of a stenographer and typewriter) would have caused her to notice any defect. The second molar tooth of the lower jaw, which had been crowned for several years, became somewhat painful. During an acute exacerbation of this pain, a medical friend volunteered to relieve her, and injected a solution of cocain into the gum. There was almost immediate oppression in breathing, and pain in the head followed by unconsciousness. Under stimulants she recovered in about two hours, but felt sick and weak all night. A small lump formed at the point of injection.

Next morning there was dimness, but no pain, in the left eye. The dimness increased until there was little more than light perception. A neighboring oculist was consulted, but in a few days the other eye became affected and she then came under my observation. The seat of the original gum puncture was still occupied by a painless exudate. In both eyes there was an absence of either redness or pain, nor did moderate pressure of palpation produce any discomfort whatever. Pupil partly dilated and fixed, but atropia had been used previously. Vision reduced to counting fingers with the right eye at eighteen inches; the left was somewhat better. The ophthalmoscopic picture was almost identical with case one—the same dustlike opacities of the vitreous and aqueous with precipitates upon the cornea and anterior surface of the lens capsule. In addition, however, there were several small pigment deposits as if posterior synechiæ had been broken down by the action of a mydriatic. Under the use of atropia and dionin, and an occasional subconjunctival injection of normal salt solution, together with the internal administration of iodide of potassium, vision has steadily improved, and is now twenty-seventieths, and rapidly getting better.

The questions which naturally arise in connection with the foregoing cases, are—was it merely coincidence, was it the result of previous disease of the teeth, or, was it a sudden trophic intra-ocular change from reflex irritation of the ophthalmic division of the fifth nerve by an injection made in the region of some of the terminal filaments of the third division of the same nerve, or, finally, is it possible that the poisonous effects of cocain on the nerve centers or terminals are to be held responsible? Whatever view may be taken, it has made

me a little more careful about advising injections of cocaine about the region of the head or face.

The Chicago Eye, Ear and Throat College has purchased the property known as 204 East Washington street. This property adjoins the present site of the College, and will give a total frontage on Washington street of $40\frac{1}{2}$ feet, and a depth of $80\frac{1}{2}$ feet on Franklin street.

It is proposed in the near future to build a new building occupying both the old and new sites. The building will be an eight-story fireproof structure, with a forced draft ventilating system, and will be up to date in every respect for the accommodation of the teaching and hospital departments of the college.

During the erection of the new building there will be no interruption of business of the institution, as one-half will be erected and occupied while the other half is being built.

The Middlemore Prize of the British Medical Association has been awarded to Dr. Sydney Stephenson, of London, for his essay on "Ophthalmia Neonatorum, with especial reference to its cause and prevention." The prize consists of a cheque for £50, together with an illuminated certificate.

DR. W. H. WILDER has been appointed Professor of Ophthalmology and Otology in the Rush Medical College of the University of Chicago, succeeding Dr. F. C. Hotz, resigned. Dr. G. E. Shambaugh, Dr. E. V. L. Brown and Dr. Brown Pusey have been appointed Assistant Professors.

DR. C. MALDO, Japan, working in the eye clinic of the University of Giessen, under Dr. Foshars, has studied a number of cases in which there was connective tissue formation on the disk. He has carefully considered all details pertaining to it, such as form, amount, color, position, complications, etc., together with its effect on visual acuity, and has reviewed the literature on the subject.

After discussing the anatomical relation of such connective tissue formation, and the numerous theories advanced to account for it, he expresses it as his opinion that connective tissue on the disk is the remains of that belonging to the fetal hyaloid artery.

DR. H. YAMAGUCH, Japan, believes that the seat of invasion in fascicular keratitis and scrofulous pannus is mostly in the superficial layers of the cornea, but that the deeper corneal layers are also involved. He concluded from his observations that the alterations found in scrofulous pannus are beneath Bowman's membrane.

The same author examined microscopically the eyes of a pig attacked by melanosis of the cornea. The pigment, he thinks, is germinated in the tissue, liquid or albuminose of the cells in that part, by special action of the epithelial cells of the cornea.

K. SHIMIZU, M. D.

A CORRECTION.

The following legend should have been given to the illustration in Dr. Zentmayer's paper on Proliferative Retinitis, which appeared in the April issue of the Annals:

"Showing the round cells, giant cells and epithelioid cells with the development of the latter type of cell into connective tissue fibers."

THE ANNALS OF OPHTHALMOLOGY.

Volume XVI.

OCTOBER, 1907

No. 4

DOUBLE PERFORATION OF THE EYEBALL BY METALLIC FOREIGN BODIES.*

EDWARD ADAMS SHUMWAY, M. D.,
Philadelphia.

At the meeting of the American Ophthalmological Society in Washington, in May, 1907 papers, upon this subject were read by Dr. Wm. E. Sweet¹ and Dr. W. E. Lambert,² but no discussion followed, and I have thought it worth while to bring the matter before the Section in connection with a case which I had the opportunity of treating at the German Hospital, during my service last Spring. The literature of the subject was reviewed by Sweet in his paper, and the comparative infrequency of such accidents which are not the result of gunshot injuries, or of explosions of dynamite etc., is shown by the fact that Kraus³ in 1904 was able to collect only 24 previously reported cases. Sweet's list added 22 more, and with Lambert's case we have a total of 47, although, as Sweet says, it is probable that the number of injuries of this nature has been greater than these figures indicate, but the precise character of the traumatism has not been recognized, owing to the imperfect means of diagnosis employed. My case is as follows:—

J. C. R. aged 39 years, American, machinist, was injured in the left eye on June 28, 1907 by a piece of iron which flew from the surface of a "flatter," which his assistant was striking with

*Read before the Section on Ophthalmology of the College of Physicians of Philadelphia, Nov. 19, 1907.

a hammer. The patient was seen at the German Hospital, within a few hours after the accident, and admitted to the ward for treatment. Examination showed an irregular cut through the cornea, commencing at its center, and running obliquely upward and outward to a point about 2 mm. beyond the corneo-scleral junction. Through this cut the iris had prolapsed; the lens was cataractous, and vision was reduced to light perception. An X-ray photograph revealed an irregular, triangular foreign body, which appeared to be in the posterior part of the eyeball. The patient was therefore etherized the afternoon of admission, the prolapsed iris was excised, the cataractous lens removed, and the magnet applied to the wound. The attempt to extract the foreign body was unsuccessful, however, although the tip of the Parker magnet was introduced repeatedly into the vitreous in various directions. The eyeball was therefore bandaged, and treatment with iced compresses and atropin begun; in addition a course of calomel was administered, and subsequently large doses of salicylates. On the following day vision was found to be nil. The eyeball was slightly more prominent than its fellow, and there was very marked chemosis of the bulbar conjunctiva, but the patient complained of no pain. Subsequent X-ray examinations seemed to indicate that the foreign body had passed entirely through the eyeball, and had lodged in the upper, outer part of the orbit. An expectant treatment was therefore decided upon, and the eyeball gradually quieted, the chemosis lessened, and as the patient was entirely comfortable, he was allowed to leave the hospital on July 10th, twelve days after the accident. Two days later, he came to my office complaining of intense pain at the top of his head, and in the occipital region extending downward into his neck. This had begun the evening before, and was accompanied by vomiting which persisted all night. Examination showed absence of tenderness to pressure on the eyeball, but the prominence of the eye had increased. The iris was discolored, but not swollen, and the injection of the eyeball had almost disappeared. Fearing an orbital cellulitis and beginning meningeal irritation, I sent him at once to the University Hospital where Dr. Pancoast localized the foreign body, back of the sclera, just

above and in contact with the optic nerve, to the nasal side of the vertical plane. On the following day, the protrusion of the eyeball had become more pronounced, the cornea was opaque and the conjunctiva chemotic. Pain was controlled by morphine. As the eye was blind, and in a condition of intense irido-cyclitis, in consultation with Dr. John T. Carpenter, immediate enucleation was advised, to which the patient readily consented. The operation was performed under ether, and the foreign body was found in the exact position shown by the chart. Surrounding it the orbital tissues and nerve sheath were in a condition of intense inflammatory edema, and cut like a piece of cartilage. The cavity was irrigated with a solution of bichloride of mercury, and a strip of gauze was inserted. This was removed on the following day, and the patient made an uneventful recovery, all meningeal symptoms being relieved immediately, and was discharged from the hospital five days after the operation. The foreign body was an irregular, triangular scale of soft iron (from the flatter) 155 mg. in weight, measuring 12.5x11x9 mm. on its sides. So accurately had the X-ray measurements been made, that the piece of metal fitted almost exactly on the drawing on the chart. The posterior perforation of the eyeball was slightly to the temporal side of the nerve entrance, and just above it. The inflammation caused by its presence had evidently involved the nerve sheaths, and the irritation had been carried backward, I take it, until there was meningeal involvement.

The case is interesting in many ways, and serves to teach what has been long emphasized in this country, the importance of accurate localization with X-rays of all penetrating foreign bodies. It is striking that of the 25 cases reviewed by Kraus as late as 1904, in only about one-fourth had there been any localization in this way, showing the slowness of the Continental Ophthalmologists in taking up this method, as all but one (Allport's case⁴) had been reported from Germany, France or Russia. I think this is due perhaps to the early universal dependence upon the sideroscope, which is of but little value when the foreign body is lodged back of the eyeball. The exact position of the body may be difficult to determine if it is near the eyeball, owing, as Hansell⁵ has pointed

out, to differences in the size of the eye, and also, as Sweet remarks, to possible errors in calculation from carelessness in measuring the distance separating the indicator and the center of the cornea, in his method.

Having determined the position of the body by the X-rays, our line of action will depend to a great degree upon its proximity to the eyeball. Experience has shown that double perforations of the eyeball, in which the penetrating body lodges in the orbital tissue, at some distance from the eye, are among the least dangerous accidents, with which we have to deal. The toleration of the orbit of even large objects has been long known, and is well shown in a recent paper by Wertheim.⁶ Cases of double perforation have been reported by Krüchow,⁷ Wagenmann,⁸ Allport,⁴ Hirschberg,⁹ Bourgeois,¹⁰ Braunstein¹¹ and others, in which there was no disturbance from the presence of the foreign body, and but little reduction in the visual acuity of the eye affected. In such cases no operative interference should be attempted.

On the other hand, the cases in which the body remains partly imbedded in the sclera, or lies against it, just outside the eyeball, especially in the neighborhood of the entrance of the ciliary nerves, are fraught with as serious consequences to the eyeball as those in which the body remains within the eye. The eyes become the seat of irido-cyclitis, and microscopically show the plastic type of uveitis, which is now recognized as most dangerous to the fellow eye. The present case has a typical history: the eye quieted for a time, then two weeks after the injury fresh inflammation appeared in the form of a severe irido-cyclitis, and an infection passing backward along the sheath of the optic nerve to the cerebral meninges. In such cases, therefore, the body must be removed, and the method of procedure will be governed, in the first place by its position, and in the second by the condition of the eye.

If the body is still imbedded in the sclera, an attempt may be made to secure it through the wound of entrance, in a recent case, or through a scleral incision if the original wound be healed. If the magnet will not dislodge the body, or if it is known to be non-magnetic (brass, copper, babbitt metal etc.), an incision should be made through the conjunctiva and Tenon's

capsule, over one of the rectus muscles, according to the location of the body, the muscle severed, and held by means of a suture, and the magnet or forceps introduced into the space of Tenon in order to obtain it. Berlin,¹² in 1866 reported a case in which his scissors struck a foreign body imbedded in the sclera, while he was enucleating an eye. The body was removed by means of forceps, the cut muscles were resutured, and the eyeball was retained.

If the body is entirely outside the eye, but close to the sclera and probably within Tenon's capsule, any attempt to secure it through the eyeball should be avoided, and the route through the space of Tenon should be chosen. In this case the giant magnet may be of assistance, if the body is of sufficient weight, as in Lambert's case, which, so far as I know, is only the second case in which a foreign body has been recovered, after double perforation of the eyeball, with preservation of the eye. If, as in my case, the body lies against the nerve, it will probably be outside of Tenon's cavity, for according to Merkel and Kalius¹³ the capsule of Tenon ends in front of the optic nerve entrance, leaving an irregular area of exposed sclera, about 1 cm. in diameter at the posterior pole of the eye. Here the body might be secured through a rent in the capsule, if the accident was recent, or through an opening made at the time of operation. But if it is imbedded in the orbital tissue, outside of Tenon's capsule, it will probably be impossible to withdraw it by means of the magnet.

If the attempt at removal be unsuccessful, and the iridocyclitis does not subside under treatment and threatens to involve the other eye, or if symptoms of orbital cellulitis or meningeal irritation present themselves, the eyeball should be promptly enucleated and the foreign body then secured. Lieblin¹⁴ has reported recently a case from the surgical clinic of Prof. A. Wölfler in Prague, in which a bullet that had lodged in the orbit as the result of an attempt at suicide, was removed by a Krönlein operation. In this case the wound of entrance was in the temple. Another case was similarly operated upon with success by Eichell,¹⁵ in 1899, and one by Mermingas¹⁶ in 1904. On the other hand, in two cases operated on in this way by von Bergmann¹⁷ in 1902, and in one by Hellbronn¹⁸ in

1905, it was impossible to find the projectile. Lieblin believes that the operation is justifiable, despite these unsuccessful cases, if the eyeball is intact, and the body is located on the temporal side of the orbit by the X-rays, and it is conceivable that in a case of double perforation of the eyeball, without infection of the organ, or reduction in its visual acuity, an attempt could be made to secure the foreign body by this method, if the patient demanded it, or if inflammatory symptoms arose. Such a combination of conditions would be very exceptional, however, and in wounds of this sort there will usually be no further disturbance if the eyeball is not infected and the body is not in its immediate proximity.

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HISTORY OF A CASE OF SUB-RETINAL CYSTICERCUS.

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About the middle of February 1907, I was consulted by the wife of a distinguished physician, who complained of a slight ocular disturbance, which she had observed for more than a month. She was annoyed by a shadow which appeared in a certain part of the field of vision of the left eye. She was a person of good health and of good constitution, and careful questioning elicited nothing of importance in the history of her antecedents. She had had no previous trouble with her eyes. Vision and accommodation were normal, as were the other ocular functions with the exception of the field of vision which contained a scotoma to the temporal side below. The scotoma was at first very small, but afterwards took the form of a well defined shadow, made up of little black points.

Ophthalmoscopic examination by the inverted image showed a small yellowish-white spot situated immediately below and outside of the papilla, the remainder of the eye being entirely normal. Fixing my attention upon this spot I found that it had in general a whitish coloring with a whiter spot in the center, was of circular form, with well defined outlines, and separated from the optic nerve by a space of about half the papilla diameter. Its situation was evidently sub-retinal, for a vessel of the retina could be seen to pass over it.

With the direct method of examination it could clearly be seen that the disease was situated immediately above, and to the nasal side of the papilla, and that it formed a protrusion above the level of the retina, for the refraction was different at various points over its surface.

Having acquired this data, it occurred to me at once that it might be a vesicle of sub-retinal cysticercus, notwithstanding my inability to observe any movement whatsoever, nor change of form, which are so characteristic of this disease. With this

idea, I inquired more closely into the patient's previous history and found that at one time not long since she had eaten ham, and some canned meats. This made me think that she might have a tapeworm, and the administration of a taenifuge a few days later, caused the expulsion of a *tenia solium*.

Not satisfied with my own observations, and judging of great importance the disease which was beginning to develop, I called in consultation Drs. Ramos and Chavez, that they might give me their opinion, as well about the nature of the disease, as about the treatment we should institute. The said consultants made a careful study of the patient, and expressed the opinion that in their judgment, it was a sub-retinal cysticercus, which from its situation in the background of the eye, would present serious difficulties for treatment, which could not be other than extirpation, all other means recommended, whether medical or surgical, having proved inefficient.

We unanimously agreed to observe for some time the progress of the disease, not believing it opportune to subject the eye whose integral functions were almost complete, to so uncertain a surgical procedure as the extraction of the parasite. We therefore waited until the development of the disease seemed to justify such a decisive step.

The disease rapidly progressed. The scotoma threatened central vision, the growth of the vesicle caused the rupture of the vessel which passed over it, causing a hemorrhage which covered it almost completely, and to some extent, the retina was detached. The peripheral vision alone remained. All of these disturbances occurred within the space of two months.

After further consultation with Drs. Ramos and Chavez, we resolved to attempt the extraction of the vesicle. In deciding upon the details of the procedure which should be followed, the observations and advice of Dr. Chavez proved of great service to me. His experience and skill in this kind of operation have been proved in similar cases which have occurred in his practice.

As the cysticercus was above and to the nasal side of the papilla, I had to choose, in order to reach it, between the internal and the upper part of the orbit, these being the shortest ways. After many experiments practiced on the cadaver, I

convinced myself that it was preferable to enter from above.

The operation was performed April 22nd, with the assistance of Drs. Chavez, Ramos and Liceaga.

Under complete chloroform anesthesia, the eyelids were amply separated by a Pley speculum; the eyeball was drawn downward, and a transverse incision one and a half centimeters in length was made in the conjunctiva, one centimeter above the cornea. The superior rectus was tenotomized a half centimeter beyond its insertion and freed from the eyeball as far back as possible.

The free end of the muscle was held by a Prince advancement forceps, and with curved needles a catgut thread was passed through each side of the muscle from above downward, first penetrating the conjunctiva and the capsule of Tenon. The sutures for the rectus tendon being thus prepared, the ends of the threads were fastened with Pean forceps and placed upon the head of the patient, separating by their weight, the overlying tissues.

As the upper end of the tendon now remained fastened with the threads, the Prince forceps were removed. Placing a fixation forceps on the ocular end of the rectus tendon, the eye was strongly rotated downward in order to bring the posterior pole toward the front. The posterior sclerotic was now cleared as far as possible of overlying tissues, and the most appropriate point for the sclerotic incision sought, with a view of getting as close as possible to the cysticercus, and at the same time having the lips of the wound close by themselves after the operation.

As experience teaches that meridional wounds are those which come together with the greatest facility, I chose for incision, a meridian situated immediately on the inner side of the vertical meridian of the eye. An incision one centimeter long was made with a cataract knife as far back as possible, disclosing the chorioid. Before injuring the chorioid, a few drops of a normal salt solution, with adrenalin were poured into the wound, the lips of which were separated by means of two small Stevens' strabismus hooks.

A short time having elapsed, and having arranged a strong

light upon the operating field by means of an intense electric bulb, I made a small puncture in the chorioid, and putting into it the dull end of a pair of very fine straight scissors, the incision was extended to equal that in the sclera. There was no appreciable hemorrhage, but a small quantity of sub-retinal serum escaped.

Carefully separating the lips of the wound, we did not see the cysticercus, and for that reason it was necessary to introduce a small Levis spoon, putting it in carefully toward the posterior pole of the eye, slightly pressing upon the retina, a manoeuver which greatly facilitated delivery, for we all saw with pleasure the appearance of the vesicle between the lips of the wound, and removing the spoon, it came entirely out.

There was no loss of vitreous, as the retina was not punctured. The lips of the sclerotic wound closed entirely of their own accord. The rectus tendon, conjunctiva, etc., were united with catgut; superficial sutures were not necessary.

Immediate examination of the interior of the eyeball with the ophthalmoscope showed the media to be transparent, and that there was no accumulation of blood in the vitreous. Thus having finished the operation, I made a binocular dressing, with strips of adhesive cloth, which are better than a bandage as they do not compress the eyeball.

I changed the first dressing on the tenth day, and left the well eye free, keeping the dressing on the operated eye for twenty-four days, at the end of which, I considered the patient well, but she continued to use dark glasses.

The patient's eye has now every appearance of being normal externally, as well as in its movements, without having suffered the slightest atrophy. The visual acuity has improved even in the central field of vision, for she can count her fingers at a certain distance, and sees the shapes of objects which surround her.

At present, on making the ophthalmoscopic examination of the operated eye, I find all its media perfectly transparent, the optic papilla to a certain extent atrophied, with its vessels very much thinner, and a large spot of chorioidal atrophy above and on the inside of the papilla, where I can distinguish the scar of

the sclerotal wound. The examination of the cysticercus demonstrates that it belongs to the *tenia solium*.

I have deemed it advisable to make this case known, for in my opinion it is of importance, as it treats of a case of sub-retinal cysticercus in the worst possible position to have been treated surgically, and the relative success, which was obtained, will serve in the future when dealing with similar cases to encourage us to begin the treatment just as soon as possible.

A COMPARISON BETWEEN HYSTERICAL AND SIMULATED BLINDNESS.*

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A superficial consideration of the subject embraced in the above title would lead one to suppose that there could be no reasonable comparison in the blindness from sources so unlike as hysteria and simulation. The symptoms in each are individual and characteristic and so distinct from each other that even the borderlands of their realms do not overlap. Even when the symptoms are vague and indefinite, the resemblance between the two affections is so slight, that a differential diagnosis is thought of, only as a remote contingency. Notwithstanding their dissimilarity, an extended medical practice will no doubt include cases in which a decision between them must be made and supported by the strongest evidence in order to prevent injustice, and lead to a proper line of treatment.

1. Hysteria may have as its principal ocular symptom, partial or complete, monocular or binocular blindness. The loss of vision may be sudden in its onset, and rapid in its recovery, and recurrent, and it may or may not be independent of any other functional or organic derangement of the eye or other organ of the body. As a psychical affection, its symptomatic possibilities are almost without limitation, unexplainable by anatomy or physiology or by known morbid processes. Our knowledge of hysteria is purely clinical and empiric, and not entirely reliable for guidance in the understanding of new cases. But some symptoms are well known, and should they all be present in any one patient, the diagnosis need not be uncertain. Many writers have so accurately described the ocular signs with illustrative cases, that text book authors have adopted their description as authoritative. The diagnosis is not made

*Read before the Section on Ophthalmology, College of Physicians of Philadelphia, November 19, 1907

by exclusion, but by the discovery of a collection of the so-called hysterical stigmata. These are ciliary spasm or paresis; unequal pupils; amblyopia due to anesthesia of the retina, corresponding in kind to the anesthesia of the skin; contraction of the field of vision, relatively greater for white than for colors, and reversal of the fields for blue and red; the tubular field, blepharospasm, monocular diplopia, anesthesia of the conjunctiva and ring scotoma. The ophthalmoscope gives no evidence of ocular disease—an essential factor in the diagnosis. The eyes have no local condition that may be held responsible for the amblyopia. These symptoms in combination, establish almost certainly the diagnosis of hysteria. Cases are frequently met with, however, as in other affections, in which only a few of the symptoms are present.

The causes of hysteria in most instances are obscure. Trauma plays an important part in the etiology. Some cases, I believe, are said to be hysteria when the hysterical symptoms may be symptoms of organic disease of the cerebrospinal nervous system. For example, a woman about sixty years of age, is at present under observation in the Out-Patient Department of the Jefferson Hospital. For the past few weeks she has noticed deterioration of vision in close work, and difficulty in making her way in the streets. Vision with correcting glass is 20-50; there is no opacity of the media, and the eyegrounds are normal in every respect. The fields of vision are limited to a central area equal to 10% from the fixation point, and are tubular. Corresponding parts of the face and arms are anesthetic. Dr. Gordon of the Department for Nervous Diseases, reported that she had paralysis agitans and hysteria.

Instances of hysteria induced by ocular traumatism are not rare. The blindness is usually sudden, follows a comparatively insignificant injury, and gives rise to, or is followed by, some of the general symptoms of hysteria. One or both eyes may be amaurotic. Willbrand and Saenger report a characteristic case of hysterical monocular blindness. A young woman, apparently perfectly healthy, was struck in the left eye by a flying fragment of a broken sewing machine needle. She conceived that the needle had penetrated the eyeball, and stated that the eye was perfectly blind. During the examina-

tion she denied that the eye had any vision whatever, but when tested by the stereoscope she could read the finest type with each eye. There was no trace of the injury, and the eye appeared healthy, but she exhibited a high grade anesthesia of the left side. After four days vision rapidly returned. In such a case, are we justified in assuming that the patient voluntarily deceived the physicians and others, or was she herself beguiled into believing that the eye was really blind, through some curious psychical process induced by the traumatism? Amaurosis may be the only sign of hysteria, as Harlan's case shows (*Med. News.*, 1. 33. 1890). A man of twenty-two was blind in one eye for ten years without the least disturbance of the nervous system. Simulation was out of the question, because the patient was willing to submit to enucleation.

The general symptoms of hysteria which may accompany hysterical amaurosis are various. They include ptosis, pharyngeal disturbances, anesthesia, loss of other special senses, pseudoparalysis of arms and legs, and mental peculiarities. The duration of the blindness varies as greatly as its etiology—from one day to ten years. Recurrences are not uncommon.

2. Simulation is also a psychic act and attempted for a purpose. The victim of hysteria unwittingly deceives himself or more properly herself, because women outnumber men as 8 is to 3, while the malingerer misleads others, but is not himself deceived. His purpose is not to excite sympathy, but to avoid duties, or to claim damages. In most cases the detection of malingering is not difficult. The reaction of the pupil to light, the muscular coordination, the stereoscope tests, the red and green letters, and the many special apparatuses, will lead to discovery. In a few unusual cases, however, particularly in binocular simulated blindness, the diagnosis is not always possible. The pupillary signs may vary greatly. In tumor of the brain, located posterior to the corpora quadrigemina, for instance, reaction to light in a perfectly blind eye may be present.

My attention has been drawn to this subject by a recent experience. A man received a slight injury to the cornea by a small fragment of glass. The glass was removed by an oculist, and the eye was declared by him to have recovered in from

two to three weeks. During recovery it was claimed that the face and head were swollen because of infection from the corneal scratch. The cornea presented, three weeks after injury, no evidence whatever of having been infected. It was entirely transparent, no trace of the superficial injury could be discovered by careful examination, and no opacity or blemish of any kind remained to bear evidence of previous infection. The other ocular structures were healthy, and did not bear out the assertion that the eye had been inflamed or severely injured. The patient declared that he was blind in the right eye even to the loss of perception of light. The acuity of vision could not be determined. The usual tests for simulation proved that the eye not only perceived light but had fairly good vision. The pupil reacted well to light, and the left pupil contracted consensually. Its visual axis responded to the action of prisms in abduction and adduction (Jackson's test). There was no deviation without prism induction. The man could read uninterruptedly the words printed on a card when a pencil was held between his eyes and the card (Weiland's test). The subsequent history is interesting. The man became an inmate of one of the hospitals of Philadelphia for treatment for intestinal disorders. He first had dysentery, and afterwards rectal fistula and appendicitis. He recovered from the operations performed to remove these troubles after a residence in the hospital of several months. At present, nearly two years after the accident to his eye, he is a physical wreck, and incapacitated from following his former occupation.

Several questions of interest and importance suggest themselves in reviewing the history of this case.

1. Could the eye have been infected, when three weeks after the injury no scar revealed the site of the injury, and no opacity or irregularity of the cornea showed that new tissue had been deposited to renew that presumably destroyed by the infective process.

2. Is it in the least degree probable that the other ocular structures would have been healthy three weeks after injury, if the cornea had been so seriously infected that the skin and subcutaneous tissue of the face and head were greatly swollen?

3. Could the bloody diarrhoea, rectal fistula and appendicitis be the result of accident to the eye?

4. Was the blindness hysterical or simulated?

Two groups of equally reputable experts testified in Court under oath, the one that the long train of disasters was traceable to infection following the accident, and the other that it was not. In view of this conflict of opinion, the thought is suggested that medical expert testimony might better be eliminated in suits for damages for personal injuries. I regret to say that the inference that pecuniary considerations enter largely into the formulation of opinion, and the character of the evidence, might seem to be justified. In trials, of which the above instance is a common type, scientific knowledge seems to carry little weight, the verdict depending rather upon the relative cleverness of the opposing attorneys in making their appeals to a sympathetic jury and emphasizing with pathetic tenderness the contrast between the "poor man" and the "rich corporation".

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TRAUMATIC IRIDEREMIA.*

THOMAS FAITH, M. D.

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The infrequency of traumatic irideremia and the scarcity of literature on the subject has led me to report the following cases, which are of considerable interest, particularly as I was able to follow them for some months after the injuries:

CASE I. A. K., a male, coal miner, aged 32, came to me in March, 1896, bearing the following note from his physician:

Spring Valley, Ill., March 20, 1896.

Dear Doctor:

The bearer of this note is a worker in one of our mines here. On the 15th inst. he was struck on the left eye with a piece of coal, which caused a perforation of the eyeball at the outer margin of the cornea. I saw him immediately, and removed some fragments of coal, and I fear some of the iris with it. The eye bled profusely, and he was put to bed with a cold wet dressing. About two hours after the accident he began to complain of pain, and the pain has persisted so continuously that I have been obliged to give $\frac{1}{4}$ grain of morphia on several occasions to give him relief. I believe the tension of the eye is increased; therefore, I have not used atropia.

An examination of the eye revealed a wound about three mm. in length in the temporal part of the cornea, almost wholly within the limbus, apparently occluded by a blood clot. The anterior part of the eye was filled with blood, and the intra-ocular tension was +2. The patient was suffering severe pain. He was ordered to have hot applications, eserine sulph., gr. I to fl 3 I, an artificial leach to the temple, and was put to bed. The pain and tension began to abate at once, and after about three days the hemorrhage began to absorb. At the end of a

*Read before the Chicago Ophthalmological Society, Dec. 1907.

fortnight sufficient blood had absorbed to enable me to see that the iris had been entirely removed; undoubtedly pulled out through the corneal wound by the physician at the first dressing, probably mistaking it for a particle of coal.

The eye remained injected and the tension slightly elevated for about three weeks. On May 3rd, the tension being normal and injection having disappeared completely, the eserine was discontinued. Three days after the discontinuance of the eserine, the tension was found to be again elevated, and the eye was slightly injected. Renewal of the eserine in weaker solution (gr. $\frac{1}{4}$ to fl. $\frac{3}{4}$ I) caused the disappearance of tension and the clearing up of the eye. On May 26th, the eye having remained clear and tension normal for two weeks, the eserine was discontinued. At this time V = 20/60, with pin-hole disk. The lens and media were clear, but the optic nerve had a pronounced glaucomatous excavation. I saw the case last on August 26, 1896, at which time the eye remained quiet; tension normal, and vision, as before stated, 20/60. The patient complained of dazzling of light, but the eye was not irritable.

CASE II. J. M., aged 26; American laborer; seen in my service at St. Anthony's Hospital, May 14, 1904. On the previous day he was struck across the head and face by a chain which parted while raising an 8000 pound load with an air hoist. He was rendered unconscious by the blow, sustaining a fracture of the skull, lacerations of the scalp, right side of the forehead, upper eyelid and face. When seen by me, the lids were badly swollen, and the anterior part of the eye was filled with blood, but there was no rupture of the globe; the tension was slightly subnormal. The lids were repaired; atropine was ordered, and moist hot dressings applied.

About five or six days after the accident, the tension was found to be increased very perceptibly, but there was no pain. The atropine was discontinued and eserine, gr. I to fl. $\frac{3}{4}$ I, was substituted. The hot dressings were continued. After a few days the eserine was increased to gr. II to fl. $\frac{3}{4}$ I, but with no appreciable effect upon the tension. On May 26th the eserine was increased to gr. IV. to fl. $\frac{3}{4}$ I, and a course of kali iodidi was begun. This treatment was continued until June 16th without appreciable effect upon the tension, though the hemorrhage

which had previously clouded the vitreous to such an extent that scarcely any red reflex could be obtained, had cleared sufficiently to enable me to see that the lens was dislocated into the vitreous, and that the iris was entirely separated from its attachment, and hung downward, held only by a shred of membrane. Later, July 11th, when the remains of hemorrhage were more thoroughly absorbed from the vitreous, the lens could be distinctly seen lying in the bottom of the vitreous chamber, and there was a deep excavation of the optic nerve with overhanging edges. The vision at this time was fingers at twelve feet; the tension $+1$. This case was seen from time to time until Sept. 8, 1904, at which time the vitreous was nearly free from floaters; the disk, in addition to being markedly excavated, was becoming quite white, and vision was fingers at five or six feet in the temporal field only. The tension was still elevated.

CASE III. W. S., aged 42; machinist; injured April 23, 1907, by jabbing himself in right eye with a chisel with which he was trying to lift a heavy piece of metal. The corner of the chisel striking the eye at the lower margin of the cornea divided it completely in a vertical direction from limbus to limbus.

He was taken to the Illinois Steel Company's Hospital, where the prolapsed iris was cut off and the wound dressed. Three days later he was removed to his home, where I saw him in consultation with the family physician. Examination of the eye revealed the large corneal wound with clotted blood between its lips. The anterior part of the globe was filled with blood, and the eye was soft. Twenty per cent. argyrol solution, atropine and bandage were advised, to be continued as they had already been applied.

I saw the case again ten days later, at which time the blood had only partially disappeared from the anterior chamber. The patient was having some pain, and there was considerable injection. The tension was $+2$. At this time the atropine was discontinued, and eserine and dionine substituted, with salicylate of soda internally.

In a few days the tension and pain became less and the blood

in the anterior part of the eye began to absorb rapidly. On May 28th the ophthalmoscope plainly revealed the condition of affairs. The iris was entirely wanting, and only a few fragments of soft lens matter and considerable blood could be seen floating about in the anterior part of the eye. The iris had either been torn out by the chisel, or was pulled out at the first dressing, some of the lens matter probably escaping at the same time.

The case continued to progress nicely, and after about seven weeks, the eye being quiet, the eserine and dionine were withdrawn. At this time $V=6/22$, with + 11 sphere. Four days after the withdrawal of the eserine, the tension was found to be increased, but was immediately reduced on renewal of the drug. The number of instillations of eserine was gradually reduced, so also the strength, until finally it was stopped altogether. The dionine solution was continued intermittently for some time after the eserine was discontinued, and now, after about thirty weeks, on Nov. 7th, with nothing but a boric solution locally the vision is $6/12$, with + 11 sphere. There are still some floaters in the vitreous, but the eye is perfectly quiet and tension is normal. This patient is also compelled to wear a smoked glass before that eye, in order to shut out the superfluous light.

A study of these cases, which are very uncommon, will naturally lead one to the following conclusions:

1. A diagnosis of traumatic irideremia cannot usually be made at once, because of the blood in the anterior part of the eye.

2. There is usually quite pronounced hemorrhage into the interior of the eye. (Wintersteiner¹ attributed this hemorrhage to the opening up of the canal of Schlemm, and the *circulus arteriosus iridis major*.)

3. Increase of intraocular tension is very likely to appear a few days after the accident. This may be explained by the remnants of the root of the iris coming in contact with the cornea, and thus shutting off drainage through the sinus angle, the same as has been observed in congenital irideremia, which is known to be favorable to, or predispose to secondary glau-

coma. It is not improbable, however, that the hemorrhage is a factor in the production of the tension.

4. Eserine is indicated, and has a favorable influence on the tension in some cases, while atropine is positively contraindicated, according to Greuning,² who says that it may cause recurrence of the hemorrhage.

1. Archiv f. Ophthalmologie, Bd. II, s. I.

2. Norris and Oliver, System. Vol. III, p. 697.

A CASE OF VERNAL CONJUNCTIVITIS SHOWING UNUSUAL CORNEAL CONDITIONS.*

WM. CAMPBELL POSEY, M. D.,
PHILADELPHIA.

D. B., a young married colored waitress, consulted the writer at the Wills Eye Hospital about two months ago, on account of irritable eyes and poor vision. It was elicited that with the exception of the usual diseases of childhood, and a possible attack of malaria at seven years of age, her health had been good. There was no family history of tuberculosis. Her father is living and healthy. Her mother died of a mammary carcinoma. A healthy twin sister and two healthy brothers are alive. The patient has had one prematurely born child which died soon after birth. Since November 1906 the patient has lived in Ardmore, Pa., prior to that her home was in Washington, D. C.

The ocular condition is dated by the patient from the 6th year, at which time the eyes became sore after an attack of measles. This condition has persisted ever since, in spite of treatment, the inflammatory symptoms appearing each year in either March or April and lasting until November or December, when all subjective symptoms disappear. The attacks are characterized by itching, burning, lacrimation and photophobia, associated at times with a moderate muco-purulent discharge. During the inflammatory period, the patient was under constant treatment by various oculists of Washington, and received eye washes and ointments in addition to blue stone applications and various forms of cauterizations. Vision was good until six years ago, since which time it has failed progressively with each attack.

When first seen by the writer, a moderate amount of ptosis was noted as present in each eye. The conjunctivae were smooth and of a slightly milky white appearance. No scars or granulations were visible, and there was no discharge. The chief interest, centered in the corneae, which were surrounded by a slightly elevated zone of yellowish white tissue, and their

*Read before the Section on Ophthalmology, College of Physicians, Philadelphia, Oct. 15, 1907

transparency destroyed throughout by irregular opacities, which seemed to be made up of a hyaline degeneration of reduplicated epithelial and subepithelial elements. The center of each cornea appeared to be avascular, but numerous small vessels extended over the limbus from the surrounding conjunctiva. The accompanying water color, which was sketched by Miss Washington, gives an excellent idea of the condition. Vision in the right eye equalled 1/60, in the left 2/60.

The patient was admitted as an in-patient and subjected to active treatment of massage of the cornea with ointments of increasing strengths of yellow oxide of mercury. Dionin in increasing doses was also administered, and pilocarpin in the strength of $\frac{1}{2}$ grain to the ounce was dropped into the eyes twice daily. The eyes were also steamed several times daily with hot vapor.

Under this treatment the ocular condition gradually improved, the corneae becoming less injected and the eyes quiet, vision now equalling 5/60 in both eyes.

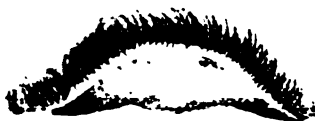
Corneal involvement in vernal conjunctivitis is not rare, but as far as the writer is aware, the case which has just been reported is unique in that it represents the involvement of the entire surface of the cornea by the pathological process characteristic of this type of disease. In a paper on vernal conjunctivitis read before the Section on Ophthalmology of the A.M. A. at New Orleans in 1903, the writer summarized the lesions of the ocular conjunctiva and cornea as follows:—

(a) The limbus of the cornea becomes thickened and encroaches upon the cornea, forming a narrow ring of grayish yellow opacity, which encircles the cornea. The inner edge of this zone is sharply circumscribed; the outer blends gradually with the surrounding tissue. This area of infiltration does not show any tendency to broaden and invade the central portion of the cornea, or to break down into ulcers.

(b) Large yellowish red elevations, more or less circumscribed, appear at the limbus in the palpebral fissure, either on the nasal or temporal side, or on both. These are usually somewhat triangular in shape, but may be oval or quadrilateral. When the former, the base of the triangle is situated at the limbus, and is sharply defined from the corneal tissue, while the

apex blends gradually with the episcleral tissues toward the equator.

(c) Under this class is included a combination of the first and second forms; in this type the entire limbus of the cornea is thickened and occupied by a series of irregularly rounded warty like tumors, grayish yellow in color. The inner edge of the zone of infiltration is not so sharply defined as in the two preceding types, and at times the corneal tissue is encroached



Margaretta Washington

Unusual Corneal Condition in Vernal Conjunctivitis. (Dr. Posey.)

on to a considerable extent. No case has been reported, however, where this was sufficiently marked to affect vision.

(d) Ordinary saturated ulcers of the cornea, which sometimes result from pressure and irritation, occasioned by unusually large and hard granulations in the palpebral conjunctiva. The tumors or elevations which surround the cornea are like the granulations in the conjunctiva of the lids, hard, dense, and as a rule non-vascular. They are not painful on pressure.

The case under discussion apparently belongs under the

third (c) group, and the writer surmises that the unusual involvement of the cornea can be attributed to the irritation excited by caustics and operations which were essayed in the early treatment by the physicians in charge, who were apparently unaware of the true nature and proper treatment of the condition.

The haze of the cornea in this case is due, in all likelihood, to thickened and reduplicated epithelium, and if the membrane were subjected to microscopical examination it is probable that epithelial plugs would be found dipping down into the stroma, quite analogous to those which are seen in the conjunctiva. Such invaginations, however, are not always present in the corneal forms and Terson, who gave an excellent resume of the histological changes of vernal conjunctivitis, made their absence a point of differentiation between the pericorneal and the tarsal varieties.

The absence of flattened granulations on the palpebral conjunctiva of this case is not unusual, for it is rather rare that the characteristic lesions of the lids and globe occur at the same time. Indeed, as Terson has pointed out, there is often a kind of compensation between the tarsal and pericorneal lesions, the characteristic changes being absent in one part while they are present in a marked degree in the other. The milky haze of the conjunctiva, which is the most constant accompaniment of the disease, is here present.

Although the late Swan Burnett, of Washington, claimed that negroes were unusually subject to vernal conjunctivitis, the experience of the writer has been that they are not more so than other races. When the disease does occur, however, in colored subjects, it usually assumes the pericorneal type, and the characteristic flattened granulations on the palpebral conjunctiva, although seen at times, are rare.

The patient is healthy, and like all other subjects of the disease, does not exhibit any apparent dyscrasia which might have prepared the soil for the conjunctivitis.

The improvement in vision has been very satisfactory, though it is not likely that any form of treatment can do more than reduce the cellular infiltration of the epithelial and sub-epithelial tissues, so that it is unlikely that the patient will ever be able to read small type.

1835 Chestnut St.

ON THE VISIBLE REMAINS OF THE VITREOUS CANAL WITH A REPORT OF CASES.*

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Some apology may be needed for speaking of a subject so well known as that of the visible remains of the Canal of Cloquet. But for the past ten years it has been my good fortune to observe several typical cases of these unusual vestiges. In hospital practice I have seen several instances a year, but of no special value. In my private practice however, I have had four cases which present typical features. An account of my observations in these cases is the object of this paper.

The Canal of Cloquet is the lymph channel found in the axis of the vitreous body. Besides transmitting the lymph it also gives passage to an artery, the hyaloid, which helps to form the vascular tunic of the lens. Between the fifth month and the seventh of human fetal life, this canal and its artery disappear, the obliteration beginning at the posterior pole of the lens. In animals born blind the canal usually persists until the eighth or tenth day; while in certain animals, as the cow, all of the Ruminants, and a large number of the Rodents, it does not disappear.

At times we find the canal with its artery, in whole or in part, remaining in Man, especially when the eye is imperfectly developed, as in microphthalmic eyes. Schöbl found them frequently in twins and in triplets, though they were lost again after a week or so.

Lindsay Johnson found these rudiments in the Primates as well as in Man, and he has grouped their occurrence under three forms:

I. A hollow trumpet-shaped tube with the base at the disk and free from blood, which we speak of as the visible remains of Cloquet's Canal.

*Read Before the Section on Ophthalmology, College of Physicians Philadelphia, Oct. 15, 1907.

II. A short, pulsating, cecal vessel filled with blood, springing from the central artery of the retina, and known as a persisting hyaloid artery.

III. A white, dense, fibrous cord, arising from the disk and terminating free in the vitreous, or attached to the posterior capsule of the lens by two or three threads.

Very frequently other anomalies are associated, as for instance, the persistence of pupillary membranes, iridal and choroidal colobomata, posterior polar cataract, and deficiencies in the optic nerve. Some disturbance, doubtless, of the mesoblastic processes is the determining factor in these cases, and even in the very persistence of the lymph channel and its artery. The posterior capsular opacity is caused by the persistence of the attachment of the hyaloid at the posterior pole of the lens.

Many cases of vitreous opacities seen in healthy young subjects, whose uveal tracts present no signs of previous or existing inflammation, are doubtless instances of the retention of shreds of the canal or the artery which have not yet been dissolved in the retrogression of the fetal structures. I have conceived the "guy-ropes" in the case shown by Wm. T. Shoemaker before the Section in April, 1906, to be either shrunken branches of the artery, or membranous expansions from the canal itself.

The first case I will record is a remarkable instance of the retention of these shreds. On the day after I finished the other portions of this paper, a young man came to me for examination. In his right eye I saw suspended in the vitreous a large continuously circular opacity. In shape and appearance it reminded me of a microscopic cross section of an artery; the inner circle was sharply defined, while the outer was irregular and had fine fibers projecting from it. It rested upright directly in the axis of the vitreous, and it appeared to be anchored below by one of the fibers. When the globe was rotated briskly, the ring fell forward to a horizontal position without appreciable descent, and rose again to the upright when the eye was at rest.

My second case was seen in a man of 23, a clerk in a railway office. He was moderately myopic. Projecting some distance into the vitreous, and beyond the nasal border of the optic disk

in his right eye, was a tubular mass which appeared to be bent back upon itself, and was connected with the center of the disk by a distinct cord. In color it was pinkish, but this might have been reflected from the highly tinted fundus. It was not possible to decide with certainty that blood flowed into this tube, yet when pressure was made upon the globe the mass pulsed distinctly. It was my privilege to be given the personal case-records of the surgeon under whose care the young man had been six years previously. In them was noted, "A clubshaped mass over disk at nasal side; it waves and is probably a cysticercus." In the left eye, along the lower border of the pupil were a few strands of pupillary membrane.

My third case was that of a young woman who was markedly anemic, being in the early weeks of convalescence from an appendectomy. In her right eye was a fine tubular projection with a rounded or knobbed head extending into the posterior vitreous, opposite the center of the disk. It was impossible to trace a line connecting it with the disk; yet it rose and fell with each distinctly pronounced pulsation of the vessels.

The fourth instance is that of a youth, a worker in dentist's materials. He believes that in earlier years he had good sight in his right eye, but that after receiving a blow on that eye the sight has been reduced, and he has had much annoyance because the globe has rotated outwardly. The vision is 5/60, Snellen, and is not improved by lenses. The eye is myopic, and the pupil is larger than its fellow.

In the superior nasal quadrant of the lens is a dense opacity occupying the posterior capsular cortex and extending to the circumference. From this opacity a few strands of deep white fibers extend into the vitreous, and are joined to the fringed ends of a large tube of grayish tissue which undulates in two curves back to the position of the central vessels. The disk is a large vertical ellipse, of about twice the diameter of an ordinary nerve head, and is without the usual lamina cribrosa, but appears to contain a deep cavity. The vessels disperse radially as though from the depths of the nerve where they had divided before being distributed to the surface of the disk. It is a form of coloboma of the optic nerve, and the tube appears to come from the center of the funnel. There are marks of

stretching and atrophy of the retina and chorioid, but these I believe to be those of myopia only.

Persistence of the entire artery as a blood carrying vessel must indeed be one of the rarest of congenital anomalies. Yet I have an imperfect recollection of seeing an instance of it in 1894 while resident surgeon at Wills Hospital. Notes were unfortunately not made, but I remember that I was warned to be on the watch for another instance of it.

More than once I have seen Johnson's second group, for my cases two and three are examples of it. As illustrating Johnson's third group, is my fourth case; and through the courtesy of Dr. Clarence Franklin, I am allowed to detail briefly a case in a man under his care. Dr. Franklin's patient is an expert mechanical engineer whose eyesight is perfect, yet in each eye there is a persistent hyaloid artery. On the posterior capsule of each lens is a nodule or patch which is the point of attachment of a twisted fibrous cord which arises at the bifurcation of the central artery on the disk.

In Dr. Franklin's case the patient experiences no difficulty whatsoever, while in my own cases the acuity of vision was not appreciably reduced except in number four, and yet it cannot be asserted that the tube alone interfered with his sight.

We may conclude, therefore, by stating that the effect of the presence of these fetal structures upon the vision varies, as might be expected, and depends upon their position and size, and whether or not they are associated with deficiencies in other portions of the globe.

235 So. 13th Street.

OBSERVATIONS ON THE MOTAIS OPERATION FOR PTOSIS. REPORT OF THREE CASES.*

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These three cases on which the Motais operation was performed are reported, not to demonstrate brilliant, or even good results, but rather to serve as a text for a study of the mechanical principles involved, and for a brief analysis of the underlying causes of incomplete success or failure in this operation.

Motais first described his ingenious operation in 1899, and although theoretically it might be considered ideal for the correction of many cases of ptosis, it has not, in this country at least, become very popular. Certain observations were made from these cases which lead me to think that the mechanism and possibilities of the operation are not correctly interpreted, even perhaps by some of its strongest advocates. Certainly, the Motais operation of practise, often possibly an alleged Motais, is not what would be expected from the current descriptions, and in execution it is difficult, however well it lends itself to simplicity on paper.

The essential feature of the operation is the transplantation of a portion, the middle third, of the superior rectus tendon into the upper lid, between the tarsus and the skin, with the idea of raising the ptosed lid by the vicarious action of the superior rectus. Motais in fact, claims to supply a perfect physiological substitute for the levator muscle by such a transplantation of the rectus tendon. That this is not actually the case, but that the lid, after a Motais operation, is held in its new position by *anchorage* to a fixed point on the eyeball, moveable only by a movement of the eyeball, is one contention of this paper. That is, there can be no elevation or movement of the lid through the transplanted portion of the superior rectus, independent of the eyeball. In that the new point

* Read before the Section on Ophthalmology, College of Physicians, Philadelphia, November 19, 1907.

of support is very close to that from which the lid is physiologically supported, and that the lid is drawn backward in elevation and not directly upward, as in those operations based on the attachment of the tarsus to the frontal muscles, and that the resulting disfigurement is nil, the Motaïs would seem to equal, if not surpass, all other ptosis operations, including those of similar mechanical principle. If we are to correct ptosis by the vicarious aid of other voluntary muscles, the almost innumerable operations for this condition fall into one of two groups, the one calling upon the superior rectus, and the other calling upon the frontalis. A third group, not however dependent upon vicarious action, would include a direct attack on the faulty levator itself in the way of advancement, shortening, etc. Such operations, with one exception, noted below, are difficult and uncertain, owing to the broad, thin tendon expansions, and the wide distribution of the lid insertion of the levator muscle.

The operations connecting the lid more intimately with the frontal muscles have often the disadvantage of subsequently calling into play a forced and somewhat disfiguring action of these muscles.

The six steps in the Motaïs operation are as follows:—

1. The upper lid is everted, the eyeball is drawn downward and the lid and tarsus upward by hooks, until the entire upper conjunctival sac is exposed and free from folds.

2. A horizontal cut 12-15 mm. long is made in the bulbar conjunctiva 6 mm. from the limbus, and from the middle of this a vertical incision through the conjunctiva reaching to the upper margin of the tarsus. The superior rectus is exposed and raised on a hook.

3. The tendon as near as possible to its insertion is buttonholed, and a slip or tongue is prepared from its middle third (about 3 mm. broad) by cutting on each side directly backward 10 mm.

4. Through the free end of this tongue, the needles of a double armed thread are passed from within out.

5. At the upper margin of the tarsus and parallel to it, the conjunctiva and levator tendon are, with scissors, buttonholed,

and the tarsus freed from overlying tissue to within 5 mm. of the lid margin.

6. Both needles are carried into this opening, and at a point about 6 mm. from the lid margin passed either through the tarsus, or outward through the skin surface of the lid. The threads are drawn until the tendon slip is within the lid and then tied. No conjunctival stitches are required.

If now we prepare such a tongue or slip from the superior rectus, it will be found to be perfectly inextensible if confined to the tendon, and if we pass through the tendon into the muscle fibres, we have a slip which is apt to part upon the slightest tension, as it is but 3 mm. broad and very thin. Although Motaïs definitely specifies 10 mm. as the length of the incisions backward, which would invariably carry them into the muscle fibres, the superior rectus tendon being on an average 10 mm. in length, I believe that the intention is to have this tongue confined to the tendon proper, and in dealing in this way with a tissue no more sturdy than a superior rectus muscle, I would regard this as essential.

In my second case, I cut beyond the tendon into the muscle, and the slip pulled out promptly.

When the slip is passed into the lid it will be further found, that, being inextensible, the lid must be passed or drawn over the slip. The method is like that of putting a glove on the hand, in contra-distinction to putting the hand in a glove. The portion of the lid or tarsus to which this slip finally becomes attached, would, it seems to me, under the anatomical conditions, be crowded up as far as possible into the recess made by the excision of the piece of tendon, and the resulting scar would occupy as nearly as possible the position of the original tendon before interference.

In other words, the lid would be anchored firmly to the eyeball, together with the reattached rectus tendon, Tenon's capsule, conjunctiva etc., and any movement of it through the superior rectus independent of the eyeball would be impossible. If this be true, the superior rectus does not, in the Motaïs operation, form a perfect physiological substitute for the levator, but offers merely a most convenient point, moveable only in common with the eyeball, to which the lid may be attached.

The possible effect to be derived from this operation is naturally very great, and when after what would seem to be a well performed operation, little or no effect is obtained, I believe the fault generally lies in the transplanting of the tendon slip into or among the fibres of the orbicularis muscle, instead of securing its attachment to the tarsus. This is particularly apt to occur when the stitch is tied on the skin surface, for then the tendon is drawn directly away from the tarsus. If the attach-

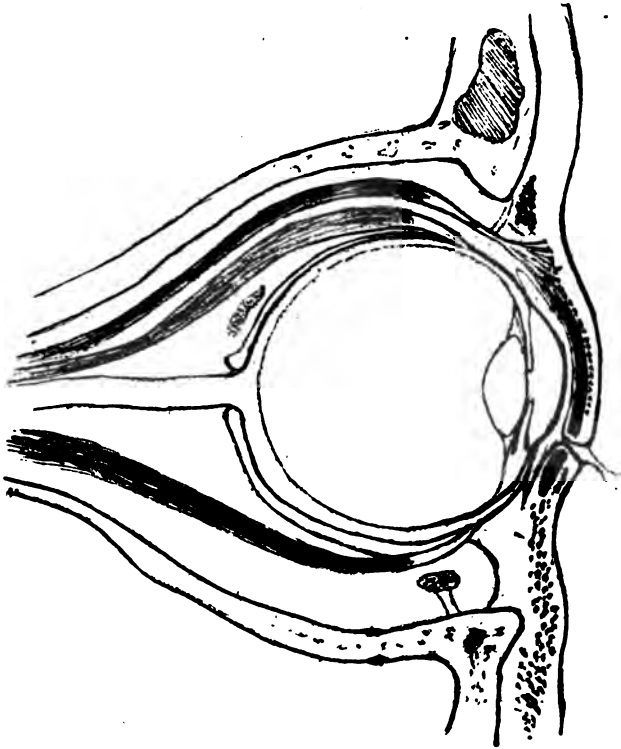


Fig. 1 Showing the Relations of the Superior Rectus, Tarsus, Levator, etc., in the Closed Lid. (Sketched from Piersol's Anatomy by Dr. Mary Buchanan.)

ment is made in the orbicularis fibres, the result becomes uncertain, owing to slipping, etc., of the muscle over the tarsus.

Any operation for ptosis to be successful, must exert its influence on the tarsus, and if we fail in this, the operation fails.

Judging from the anatomical situation of the parts under

discussion, the proper place for the attachment of the tendon tongue is probably at, or very near, the upper border of the tarsus, and it would seem to be impossible to secure permanent attachment very far below this point, even if desirable. (Fig. 1.)

The upper margin of the tarsus in the normally raised lid is very close to, and a little in advance of the superior rectus, but it is difficult to conceive of an inextensible tendon being made to reach far below this point. Mechanical lagophthalmos, however, could, I am sure, easily be produced by an overdoing of this operation, a possibility which would make a more exact technique most desirable.

One of the valued features of this operation has generally been considered to be the fact that the field of operation was, with the exception of the single stitch, entirely within the lids, no wound of the skin being necessary. This advantage however, would scarcely seem sufficient to bar an open operation if such would give a better result. I would, therefore, suggest first, a modification of technique which, so far as I know, has not been tried and which would permit of greater accuracy and facility in attaching the rectus tendon to the tarsus, a fundamental requirement of the operation; and second, call attention to an application of Motaïs's principle, devised by Cannas, which seems to me worthy of consideration, subject to certain important changes.

With regard to the modification of technique, the first stage of the operation remains unchanged except that in passing the double armed thread through the prepared tendon slip, pass the needles from above downward, placing the loop on the upper surface. Then make a horizontal incision through the skin of the lid and the orbicularis muscle down to the tarsus a little below its upper margin. Undermine the orbicularis fibres by pushing them upward or backward, exposing the tarsus to its upper margin. Euthionhole Müller's muscle and the conjunctiva, and through this opening carry the sutures with the piece of tendon, and fasten the latter directly to the surface or edge of the tarsus precisely as we do the tendon to the sclera in an ordinary advancement. Having dipped each needle into the tarsus and brought tarsus and tendon slip into direct contact, restore the orbicularis fibres, carry the needles through

them and the skin, and tie. Close the wound in the lid with two or more stitches.

An open operation of this kind would insure an attachment to the tarsus, and prevent attachment into the orbicularis and skin alone, with probable slipping and negative effect on the tarsus. The advantage of the open method would be in the accuracy and certainty with which the rectus tendon could be grafted at the point desired.

Cannas, applying Motais's principle to a different procedure, sought to stitch with catgut, the belly of the levator, to that of

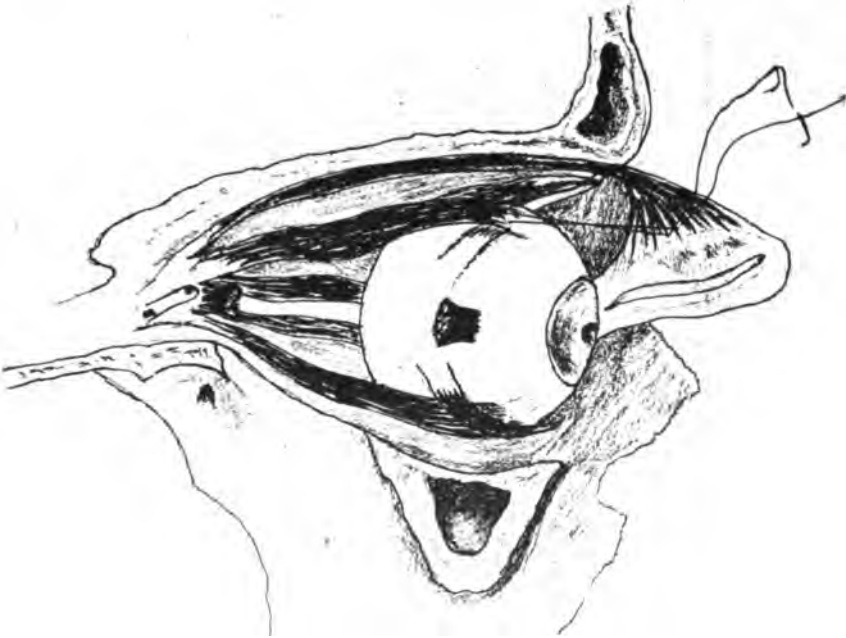


Fig. 2. Showing Placement of Stitch in Proposed Modification of Cannas' Application of Motais' Principle.

(Sketched by Dr. Mary Buchanan, in part from Piersol's Anatomy.)

the superior rectus. This operation seems to me uncertain, and of doubtful efficacy, but if modified as follows, would offer greater promise of success. Expose the superior rectus as in the Motais operation, and the margin of the tarsus and tendon of levator as above described. Raise the rectus tendon on a hook, and without cutting a tongue therefrom, pass a double armed thread through it from within out, or from below up,

placing the loop on its under surface. Then pass the needles through the levator tendon near its insertion, and by drawing the threads, bring this portion of the levator firmly against the rectus tendon, where it will unite, carry the needles through to the skin surface and tie. Here again, we would have the base of the lid anchored to the eyeball through the rectus tendon, and by a method far more simple than the original Motaïs. (Fig. 2).

The superior rectus being present, and there being no downward deviation of the eyeball, I know of but one contra-indica-



Fig. 3.

tion to the Motaïs operation in its original or modified forms; —a poorly developed muscle tendon. A permanent paralysis of the superior rectus, is not necessarily, in my opinion, a contra-indication, but may be rather an advantage, and in such a case, I see no reason why the whole tendon even, should not be

transplanted and put to some use. This of course could not be done if the eyeball remain in downward rotation. The inferior oblique would supply the counter force as well as a certain amount of upward movement. I am aware that this statement is contrary to the prevailing ideas of this operation, but if the mechanical principles above outlined are correct, it is the only logical conclusion.

A small, thin, poorly developed tendon, is a positive contra-indication, and if such be found, the operation had better be abandoned, at least in its unmodified form.

The three cases need not be reported in detail. They were all operated under general anesthesia, the first in the German-town Hospital, the second in the Presbyterian Hospital, and the third in the German Hospital.

In Case I, the ptosis was unilateral, almost complete and congenital. The result was about half elevation. Case II, was a boy about 14 years old, ptosis unilateral, congenital and incomplete. Result—total failure, because the tendon slip included muscle and promptly separated.

Case III—(Fig. 3) Partial unilateral ptosis, congenital in a young woman. The tendon slip in this case was perfectly firm and substantial. The immediate effect was very pronounced, it being impossible for the patient to close the eye for some days, on account of which, commencing ulceration of the cornea, from contact with the dressing, appeared as a complication. A second complication of minor importance, was a stitch abscess. This was a very favorable case for the Motaïs operation, and I believe, with a little more skill on the part of the operator, and by the open method, could have been done with great exactness and almost perfect graduation.

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ABSTRACTS FROM ENGLISH OPHTHALMIC
LITERATURE.

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Some Observations on the Color Sense and Visual Adaptation of Birds.

HESS, CARL, Würzburg, Germany, (*Ophthalmic Record*, August '07) writes at length of the color sense and visual adaptation of birds. He describes experiments made in an effort to decide whether dark adaptation is confined to the retinal rods and whether the cones are capable of adapting for darkness. He noticed that hens picking up wheat grains are directed only by their eyes; they pick only when they see the grains. When allowed to feed with the grains scattered on a black ground illuminated so that a shadow falls on the middle of the lighted area, the hen picks up all the grains to the right and left of the shadow, but does not pick up the grains on the shadow. When the light was diminished to a certain degree the hen ceased to feed. In these experiments the writer was able to measure the intensity of the light, by using an Aubert's diaphragm or an iris diaphragm as the aperture, the diameter being marked in millimetres. He found that a hen which had been light adapted

when placed in a dark room with the diaphragm opened sufficiently would immediately pick up wheat grains from the black ground. By repeating the experiment he found that we require about the same intensity of light as the hen does in order to distinguish the grains of wheat on a black ground. In making these experiments with pigeons he found that albinotic pigeons acted as did the other varieties.

These experiments prove that day birds, in whose retinae rods are almost completely absent show a very marked adaptation. By dissolving the colored fat-balls of the retinae of hens he found they were almost devoid of visual purple. Other experiments showed that when grains of wheat had been made to appear in different colors by having these spectral colors projected on them, the hen picked the red grains first, then the yellow and green grains, while the blue and violet were not picked by hens adapted for daylight even when those grains appeared brighter than the red grains.

Further experiments proved that hens and pigeons see the spectrum approximately as we do through yellow and red glasses, and that their color sense may be similar to ours.

These experiments also show that it is the outer segments of cones and rods which form the percipient apparatus of the retina, from which the sensation of light is carried to the nerve centers; it is as if there were small red and yellow screens before the perceptive outer segments of the cones. O. W.

A Case of Epithelioma of the Lid Healed by the Local Application of Chlorate of Potash.

ZENTMAYER, WILLIAM, Philadelphia, (*Ophthalmic Record*, August, '07) reports a case in which the patient, a man 55 years old, stated that eight years before he had had a mole burned off the lower left eyelid which was followed by the formation of a pimple which later broke down. There was no pain, but at times a slight bloody oozing. A triangular ulcerated area involved the skin of the lower lid, its base extending along the free margin from the inner canthus to a point beyond the median line. The inner half of the ulcer was much deeper than the outer and was covered by a brownish, dry secretion, the margins were irregular and indurated, and there was ectropion of the lower lid.

The surface was first cleansed, and then powdered chlorate of potash was thoroughly rubbed into the floor and edges of the ulcer, at first every day, later every other day. After a week of this treatment the ulcer gradually diminished and is now healed. There is little ectropion, and the mucous edge shows exuberant granulations. O. W.

Self-Retaining Lid Plate.

BLACK, NELSON M., Milwaukee, (*Ophthalmic Record*, September '07) describes a self-retaining lid plate which he has devised. It consists of a forceps, the lower blade of which is wider than the average lid plate at the distal end. The upper blade is composed of two parts, and curved at the distal end to correspond to the curve of the lid margin, the curved end being movable so as to be adjusted to a deep or narrow cul-de-sac. The upper blade is attached to the lower one by an aseptic lock; a small screw serves to bring the blades in contact.

O. W.

Delayed Development of the Lacrimal-Nasal Duct.

JACKSON, E., Denver, Col. (*Ophthalmic Record*, July '07) in an interesting article says that lacrimal obstruction showing immediately after birth or as soon as the secretion of tears has begun is due to the delayed development of the nasal end of the lacrimal duct, unless disease in the nose or parts adjoining in the lacrimal passages offers a different explanation. He refers to autopsies made on new-born children by de Vlacovich and Rochon-Duvigneaud which revealed cases in which the orifice connecting the lacrimal drainage canal with the nose had not been opened. As the lacrimal secretion is not noticeable for several weeks after birth no functional demand is made upon the lacrimal passages, and in many cases of delayed opening of the duct into the nose no symptoms are noticed as the opening occurs in time to meet any demands made upon it.

The cases in which symptoms arise are those in which the canaliculi are open; extraneous material reaches the retained contents of the lacrimal sac; infection occurs, and the usual symptoms of dacryocystitis develop. The sac is distended, and there is regurgitation on pressure. Symptoms of inflam-

mation about the sac and lacrimal conjunctivitis sometimes occur. When these symptoms are evident, palliative treatment consists of frequent careful expression of the contents of the sac and the use of a solution of protargol (2 per cent.), or argyrol (5 per cent) at short intervals, unless some other procedure is indicated.

The writer reports a case which came under his observation. The patient was 8 weeks old. When a week old tears ran from the left eye and later from both eyes. There was a muco-purulent discharge from both eyes with a slight conjunctival hyperaemia. The left eye had been red. Pressure over each sac caused a frequent regurgitation of muco-purulent matter. The protargol solution was prescribed for use six times daily after the sac had been thoroughly emptied. After treatment had been continued for a month there was a little regurgitation in the right eye, the left remained unchanged, and in both eyes the lacrimal conjunctivitis continued. Three weeks later the left eye suddenly improved and the lacrimal conjunctivitis disappeared. A slight regurgitation of stringy matter from the right eye and a conjunctivitis continued for several weeks longer. Within three months from the beginning of the treatment both eyes were entirely well.

In the opinion of the writer, lacrimal obstruction is due to delayed development of the tear passages and usually terminates in spontaneous, complete and permanent cure, the establishment of this condition being rather sudden.

The writer asserts that where operative measures are imperative, the operation should be done in such a way as to leave the puncta and canaliculi in practically normal conditions.

O. W.

Congenital Dacryocystitis.

HIRSCH, G., Halberstadt, (Abridged translation from the German Edition, August 1902, by Foster, Matthias Lanckton, *Archives of Ophthalmology*, September 1907), believes that in doubtful cases patients seek the doctor more often than in times past, whence we see certain diseases more frequently now than formerly. This explains why older observers never saw a case of congenital dacryocystitis, while Peters has seen forty in eight years, for in all cases this disease seems to heal

spontaneously. The writer reports five cases which may be summarized as follows.

Fränkel's pneumococcus was present in the three cases in which the pus was examined. In each the mother had a severe leucorrhoea. As this disease appears at or shortly after birth, like ophthalmia neonatorum, he ascribes it to a pneumococcus infection from the vaginal secretions of the mother. Peters found the disease on the left side in six cases, on the right in only one. The writer found the proportion 3:2. In adults also lacrimal troubles seem to be more frequent on the left side than on the right, for out of 95 cases he found the left sac affected in 33, the right in 20, both in 42.

H. G. G.

The Unilateral Form of Tarso-Palpebral Vernal Conjunctivitis Occurring in a Young Girl.

WOOD, CASEY A., Chicago, (*Ophthalmic Record*, June '07) reports a case of unilateral tarso-palpebral vernal conjunctivitis in a girl, 11 years old, healthy, and of good history. When three years of age she had a convergence of the left eye which was corrected later by the use of glasses. In the Spring of '03, and in each subsequent Spring for four years, her eyes became inflamed, and as the weather became warmer she had itching, vertigo and headache with discharge from the left eye. Last year the eye began to water excessively, and horny growths appeared on the upper left eyelid which were removed, but recurred. The vision was 20/70 minus, and Jaeger No. 1 left; 20/15 minus, and Jaeger No. 1 right. There was ptosis on the left side, the upper lid margin almost covering the superior half of the cornea. The cilia pointed downward, the external mid-palpebral groove was obliterated by the bulging of the middle third of the upper lid, which showed a purple discoloration. Under the lid, almost the entire conjunctival surface was covered with irregular, roughly polygonal, partly pedunculated, flat topped masses of hardened tissue separated by sulci in some places 2 mm. deep, which extended to the conjunctiva beneath. Secretion was scanty, but a white membrane covered the diseased surface. There were new vessels in the upper sixth of the cornea which resembled the vascular pannus of trachoma.

The cartilaginous masses were removed and their bases curetted. The tissue showed a chronic hyperplasia of the epithelium and under-lying tissue. Under stain for elastic tissue the stroma was seen to be full of wavy elastic fibers. The amount of round cell infiltration showed the process to be of inflammatory nature.

Treatment consisted of cold fomentations, hourly, to the ocular region, irrigation of both sacs with a saturated solution of boric acid in 1—10.000 of mercuric chloride and 40% of borax. The everted lid was exposed to the X-rays daily for six weeks, the topical treatment being supplemented by a solution of (1—1000) suprarenalin applied before the exposure.

The wound healed well and all symptoms were relieved in a short time. O. W.

Formation of a Permanent Superior Retrotarsal Fold, in an Operation for Symblepharon, by Suturing Transplanted Flaps to the Tendinous Expansion of the Superior Rectus While the Lid was Doubly Everted.

WOLFF, HUGO, Berlin (Translation by Foster, Matthias Lanckton, *Archives of Ophthalmology* July 1907) describes his operation as follows. After the attachment of the upper symblepharon had been freed from the cornea, it was loosened to the upper retrotarsal fold, until the lid could be doubly everted. This artificial increase of the wound surface to be covered he believes to be of advantage on account of the contraction to be expected later. The pathologically thickened tendinous expansion of the superior rectus had been severed from its attachment to the upper margin of the tissue in cutting away the conjunctiva; this tendinous expansion was then seized with two forceps, stretched horizontally forward, cut horizontally through, and the upper edges of the flaps sutured into the incision. To cover the raw surface on the upper lid and sclera, two separate flaps were used. The portion on the lid was covered by a flap taken from the conjunctiva of the sound eye. It was first sutured to the two lateral margins and the upper edge of the tissues, leaving a small surface on the tarsus bare. The still unattached margin of the flap was then joined to the edge of the expansion of the rectus by a suture at each corner. The portion on the sclera was then covered by a rectangular

flap 12 mm. long by 10 mm. broad, taken from the mucous membrane of the lower lip. This was united by suture with the edges of the conjunctiva, while its lower margin extended about 2 mm. below the limbus of the cornea. The upper margin of the flap was then joined to the middle portion of the expansion of the rectus by two sutures which included the hitherto unfastened middle portion of the edge of the first flap. After the conjunctival flap regained its rosy hue, the upper lid was returned to its normal position and the loosened conjunctiva on the inner and lower border of the cornea was sutured to the epibulbar tissue about 5 mm. from the limbus. H. G. G.

Cases of Congenital Inequality of the Size of the Cornea in Normal Eyes.

HUBBEL, ALVIN, Buffalo, (*Ophthalmic Record*, June '07) describes two cases of congenital inequality of the size of the cornea in normal eyes. The first, a young woman, aged 18, had never experienced any distress from the use of her eyes; vision in both eyes equalled $5/4$ Snellen, and also with +0.50 D. sph. Maddox rod showed slight esophoria and hyperphoria, the fundi were normal. The pupils were of the usual size and of the same tint, and responded equally to light. The ophthalmometric reading for each cornea was, + 0.50 D. cyl., ax. 90. Each cornea was almost a perfect circle with the usual variations. The horizontal diameter of the right cornea was ten mm., that of the left, thirteen mm., measured to the extreme margin of the transparent portion.

In the second case, the patient, a girl of 12 years, had suffered from frequent and severe headaches. From her birth the pupils had differed in size and the eyes were not of the same tint. She had a manifest hypermetropia of 1.00 D. in the right eye and 0.50 D. in the left. Under homatropine, the hypermetropia was 1.25 D. in each eye. Vision in each was $5/5$, the Maddox rod showed seven degrees of esophoria and one half degree of right hyperphoria, Fundi were normal and the same in both eyes. The right pupil was the smaller in moderate light, but in bright light both pupils contracted to almost the same size; in deep shadow the left dilated to almost twice the size of the right. Under homatropine the left pupil dilated the more. Both corneae had the usual form, but differed in size,

the right having a less diameter than the left. The measurements of the horizontal diameter were—in the right eye, $11\frac{1}{2}$ mm., in the left, 13 mm. O. W.

Notes of a Case of Keratitis E Lagophthalmo With Pathological Findings.

TOOKE, FRED T., Montreal, Can. (*Ophthalmology*, July, 1907) reports a case illustrating the difficulty in differentiating keratitis E lagophthalmo from keratitis neuroparalytica. A farmer, aged 35, was admitted to the Royal Victoria Hospital, suffering from a cerebellar neoplasm, proved on autopsy to be associated with a generalized meningitis. The eye symptoms were a double optic neuritis, pupils equal and responsive to light and accommodation, slightly restricted fields of vision, paralysis of the fourth nerve, anaesthesia and analgesia about the upper part of the left cheek and lower lid with diminished conjunctival and corneal reflexes on the same side. About two weeks later the lids became fixed in position, half open. A beginning loss of epithelium of the exposed part of the cornea was noticed to extend downward in the shape of a wedge, with its apex below. There was no ciliary injection. This process did not extend to the part of the cornea covered by the lid. The same process soon began to appear in the other eye. The patient died and the eye was removed for microscopic examination. The affected area showed the surface epithelium cells to be entirely removed, exposing Bowman's membrane, which appeared to be healthy until the region of greatest injection was reached, where it appeared shrunken, atrophied and broken not far from the limbus so as to expose the underlying infiltrated corneal tissue. The infiltration was most severe underneath the broken Bowman's membrane beneath which were leucocytes, a few polymorphonuclear cells and many proliferating corneal corpuscles. The various theories advanced by many writers are mentioned, and the consensus of opinion seems to be that a neuroparalytic keratitis is an exposure keratitis rather than one due to any trophic disturbances of special fibers of the fifth nerve. A. F. A.

Dendritic Keratitis.

CHARLES, J. W., St. Louis, Mo. (*Ophthalmology*, July 1907) discusses the probability of this disease being due to a terminal

nerve lesion. He concludes that dendritic keratitis is caused by (1) a degeneration of nerve terminals caused by toxine, or (2) it is an active neuritis with consequent injury to surrounding parts by loss of nerve supply (trophic), and (3) this form of keratitis may be classed as vesicular (herpetic) or papular (malarial).

A. F. A.

The Origin of Iris and Anterior Chamber Cysts.

WOELFFLIN, ERNST, Boston, (Translation by Foster, Matthias Lanckton, *Archives of Ophthalmology*, September 1907) classifies these cysts as follows 1. serous cysts; 2 solid cysts; (epidermoidomata) 3 entozoa cysts; 4 dermoid cysts. Serous cysts are most frequently met with, while examples of the third and fourth groups are rare. They may also be classified as congenital and acquired, the latter to cover cases which appear spontaneously and others which are the results of traumatisms. The most important point in the pathogenesis of iris cysts is their histological constitution, whether they sprang from epiblastic or mesoblastic tissue and are epithelial or endothelial in their nature. During the past year three types of the traumatic serous cysts have been distinguished by the Vienna school: 1. Those which are entirely surrounded by iris tissue; 2. Those which lie partly in the parenchyma of the iris, partly in the anterior chamber, cysts of the iris and anterior chamber; 3. Those which lie entirely in the anterior chamber, and the iris forms only a part of their boundary. The writer then describes a case which cannot accurately be said to fall into any one of the above groups while it might at the same time belong to all of them. The eyeball was Enucleated and studied microscopically, when it was found that the cysts did not arise from a single epithelial nucleus, but from several, which united by fusion of their walls of separation. Further, they were not closed, but were connected with a cylindric space which ran nearly vertically in the region of the original wound in the sclera, and formed a direct connection between the upper inner part of the anterior chamber and the lower part of the posterior.

H. G. G.

A Case of Gummatous Iritis.

RUTHERFORD, R. W., Chatham, Ontario, Can., (*Ophthalmic Record*, August '07) reports a case of gummatous iritis. The

patient, a woman aged 26, complained of severe pain in the left eye. Examination showed marked pericorneal injection, the iris sluggish but not discolored, the pupil oval, and a slight photophobia. Atropine (1 per cent.) was instilled, dark glasses were prescribed, and hot applications made to relieve the pain. On the following day the pupil was irregularly dilated by the atropine, the pupillary margin showed a yellowish nodule which projected into the anterior chamber. The next day this nodule had become larger and more vascular, the color had changed to a dirty brown; and there was severe pain which was relieved by the use of dionin.

Diagnosis favored gummatous iritis although the patient gave a negative history of syphilis. Hutchinson's pills were prescribed, beginning with four a day, increasing in a few days to eight, together with five drops of a saturated solution of potassium iodide after each meal, increasing a drop a day. The patient improved, and after a week of treatment the nodule began to disappear. After 11 days of mixed treatment the nodule had disappeared leaving a scar on the anterior surface of the iris. Injection was decidedly less, the use of the medicine was continued, and the eye soon regained its normal condition.

In case of doubt as to whether a case is one of tuberculous or gummatous iritis, the writer advises the use of anti-syphilitic treatment as a help to correct diagnosis. O. W.

An Unusual Form of Hereditary Congenital Cataract Occurring in Several Members of a Family.

CHANCE, Burton; Phila., (*Archives of Ophthalmology*, July 1907) describes the case of a family in which five members were affected by a very definite and peculiar variety of congenital cataract. The first case was a boy aged eleven, the sixth child of the family, the vision of each eye equalled 5/45, with correction 5/15. In the center of each lens was an opacity in the form of a sharply defined circular disk, very thin, situated apparently between the nucleus and the posterior pole, of about the size of the pupillary space, and of a minutely granular consistence. As the actions of the father, who was with the boy, were suggestive, his eyes were examined and opacities re-

vealed in his lenses similar to those found in his son's. In all five cases the cataracts were partial, circumscribed, and could be seen only by using strong lenses in the ophthalmoscope. They were of the same kind in each case and were large enough to block the pupillary spaces, as they measured about 4 mm. in diameter. In each person they were double and without exception accurately symmetrical in the two eyes. They appeared to be stationary.

H. G. G.

Non-Surgical Treatment of Lamellar and Nuclear Cataract.

BERNSTEIN, EDWARD J., Kalamazoo, Mich. (*Ophthalmology*, July 1907) after discussing the various theories concerning the origin of this form of cataract, proceeds to give the case history of three of his patients, one a child of six, one a woman of seventy two, and the third a woman of seventy, in all of whom well marked cataracts were found. Subconjunctival injections of dionin solutions of various strengths were used with marked improvement in vision in all three, although the lenticular opacities did not entirely disappear.

A. F. A.

Extensive Disease of the Retinal Vessels (Vasculitis and Peri-Vasculitis) Followed by Proliferating Retinitis in a Young Colored Man.

DE SCHWEINITZ, G. E., Philadelphia, (*Ophthalmic Record*, September '07) describes at length a case of extensive disease of the retinal vessels (vasculitis and peri-vasculitis) followed by proliferating retinitis in a young colored man. The patient had applied for treatment at the Dispensary, for the relief of fronto-occipital headache. The vision of the right eye was 6/5, that of the left eye, 6/15, 6/7.5 with correction. The ophthalmoscopic record is: Media clear; disks moderately vertically oval; refraction hypermetropic. The patient was seen a year later; the vision of the right eye was 6/15, that of the left eye 6/6. He complained of a sensation like that of a foreign body in the eye which had lasted for two months. The bulbar conjunctiva was hyperaemic and there was a peri-corneal and conjunctival injection with a marginal ulcer on the nasal side of the right cornea which was treated with boric acid and atropine. The right eye was more prominent than the left. Thirteen days later, examination showed: Vision of the right eye 6-7.5.

eye more prominent than the other; cornea hazy near the corneal ulcer; a delicate band of ciliary injection; pupil widely dilated; lens and vitreous clear.

The ophthalmoscopic examination showed the optic disk to be nearly round, with a small central excavation, the veins to be swollen, uneven and thickly coated with white tissue.

Sheet-like hemorrhages and areas of exudate showed between the branches of the upper and lower temporal veins and the upper nasal vein, the arteries were small and lined with white tissue. The left eye showed a similar though less marked condition. General medical examination failed to reveal any cause for this ocular condition. A thorough mercurial and iodide course had no effect, and at the end of two weeks the hemorrhages had increased so that vision of O. D. was reduced to hand movements, and that of O. S. to 6/150; a fine punctate haze developed throughout the right vitreous. Two months later there was marked cyclitis and exophthalmos of the right eye, also soft synechiae readily broken loose with atropine.

The patient was referred to Dr. W. G. B. Harland for investigation of the rhino-pharynx and the following conditions were found: Enlargement of the turbinates, especially those of the lower side: chronic congestion of the lining mucous membrane, a mass of adenoid tissue in the vault of the pharynx, soft, with an even surface of dark red hue. The faucial tonsils were very large and fibrous, the surface of the right one traversed by dilated blood vessels. The pharyngeal and faucial tonsils were removed, one at a sitting, bleeding being rather free.

A stereoscopic skiagraphic examination of the patient's head by Dr. Pancost revealed an abnormal development of the accessory sinuses. The frontal sinuses were very large and extended the entire width of the frontal region and well into the temporal fossae; bony partitions were lacking and the walls were abnormally thin. The sphenoidal and ethmoidal sinuses showed similar conditions, the chambers were greatly enlarged, and the walls thin, except the anterior which was decidedly thickened: bony partitions were present, but so thin as to suggest that these two sets of sinuses merged into each other.

About three months later a small infiltrate formed in the

center of the right cornea, with increase of the cyclitis and exophthalmos, which were relieved by the removal of the adenoid tissue by Dr. Harland; the retinal lesions remained unchanged. There was a gradual increase in the hemorrhages and exudates and the lesions of proliferating retinitis began to show. Vision in the right eye was reduced to counting fingers at a foot, that of the left eye to 2/45. There was a proliferating retinitis and a formation of large vessel-like masses of white tissue pressing forward into the vitreous.

A few months later the conditions were: Vision of O. D. hand movements; a small corneal scar marked the position of the former disk-like infiltrate. The surface of the lens showed several clumps of iris pigment; the pupil was widely dilated; the vitreous cloudy and the disk invisible. In front and above the disk, and extending upward and forward was a large veil of bluish-white tissue that had on its surface congeries of twisted vessels. Below the disk was a reddish mass, and a similar blood-carrying veil. On the nasal side were large sheet-like veils carrying twisted vessels and pressing forward 17 D. into the vitreous. From the top to the bottom of the eye ground on the nasal side was a falciform stripe of glistening tissue. There was a partial detachment of the retina, the cornea was clear, the vision of O. S. 2/150. At a point approximately corresponding to the disk and occupying an area of triangular shape was a large mass of connective tissue that supported congeries of vessels and hemorrhages, and was bounded by a glistening band of tissue between the disk and the periphery, which was joined on its nasal side with a similar band and also with a band of like tissue which bounded the lower portion of the mass. In the inner and lower portion of the eye ground were large, glistening white masses, and to the nasal side of the disk were sheet-like hemorrhages and large glistening veins. The right eye was prominent with imperfect convergence.

It is the opinion of the writer that although clinical history and examinations failed to prove that the patient was the subject of syphilis, yet that condition would best explain the extensive disease of the retinal vessels.

This article is an unusually long one, beautifully illustrated, and must be read in order to be fully appreciated. O. W.

Venae Vorticosae Choriovaginales in Myopic Eyes.

VON DER HOEVE, J., Leyden (Translation by Foster, Matthias Lanckton, *Archives of Ophthalmology*, July 1907). During an ophthalmoscopic examination vorticose veins may be seen on rare occasions to perforate the sclera in its posterior part instead of at the equator, and then to find their way backward probably through the sheath of the optic nerve. Oeller named such veins venae vorticosae choriovaginales. The writer reports two cases in which this anomaly occurred. In each case there was an abnormal, deep broad vessel which passed out of view in the neighborhood of the optic nerve. Various tests proved the vessel to be a deep vein formed from many branches, and the writer concludes it to have been a vorticose vein.

Coloboma of the Chorioid Upward. Opaque Nerve Fibers.

DERBY, GEORGE S., Boston, Mass., (*Ophthalmology*, July, 1907) reports a case of a young woman of 20 years whose sight in one eye had been poor since childhood. The right eye was normal. In the left eye, about one-fifth of the anterior capsule of the lens showed a thick, white opacity extending upward and inward. The fundus examination showed a small, hyperaemic papilla, almost completely surrounded by opaque nerve fibers. Above the disk and somewhat separate from it was a rounded coloboma of about three disks diameter and with a depth of four or five diopters. The borders were steep and the bottom was regular in outline and of a glistening blue tinge. V. Hippel's theory of causation of these defects is discussed.

A. F. A.

**Double Choked Disks Associated With Compressed Air Disease.
(Caisson Disease.)**

CALLAN, LEWIS WHITE, New York (*Archives of Ophthalmology* July 1907), reports the case of a man who after working in a caisson two months without difficulty, began to have slight attacks of the bends. For about two months he had mild attacks two or three times a week. One month before his admission to the Infirmary he fell to the sidewalk shortly after leaving the lock, and the next day he reported at the hospital because he noticed that his sight was not so good as usual and

that he had diplopia. Here it was found that he had a slight inconstant convergent strabismus of the left eye, and the ophthalmoscopic examination showed marked choked disks with a few striated hemorrhages on the nerves and in the region of the macula. Choking of O. D. about 6 D; O. S. 7 D. O. D. V. = 20/100 O. S. D. = 20/200. He was admitted December 17th, 1906 and received the following treatment: Rest: K. I. 10 gtt t. i. d. increasing doses. Inunctions of Hg. $3\frac{1}{2}$ t. i. d.

From January 15th on he improved rapidly after a course of vomiting, headaches, vertigo and nausea and on Feb. 16th was discharged feeling well and strong with a vision O. U. 20/40. March 27th V. O. D. = 20/20; V. O. S. = 20/40. Choking of nerves decreasing slowly, fields concentrically contracted. Pupils react well to light and accommodation. No diplopia or convergence of O. S. Patellar reflexes normal. H. G. G.

The Post-Operative History of Sixty Cases of Simple Chronic Glaucoma.

BULL, C. S., New York, (*Ophthalmic Record*, June, '07) gives the post-operative history of sixty cases of simple chronic glaucoma which have been treated by him in private practice.

Iridectomy was performed on 115 eyes, one operation on each eye. The ages of the patients varied from 37 to 78 years, 27 were men and 33 women.

Before the operation there was concentric narrowing of the field of vision in all cases. Tension varied during the day and was higher in the morning. Tests of six cases showed increased arterial tension. Arteriosclerosis was present in the retinal vessels of a large proportion of the patients over 60 years.

After the operation there was a temporary improvement in the central vision in 14 eyes, but no permanent improvement in any. There was no immediate impairment of central vision, but there was a slow and steady failure in 94 eyes during a period of from five to eleven years. In 16 eyes the result was absolute glaucoma. There was immediate lessening of the tension in 112 eyes, and permanent in 24, in three, the tension was not affected. The best results were obtained in cases where the central vision was best, and the field least encroached upon by the operation.

The writer remarks that surgical interference is least effective

where the disease becomes manifest at an early age, also, that iridectomy must not be regarded as a means of cure, but rather as a method of staying the progress of the disease, and much depends on its early performance.

O. W.

The Treatment of Ocular Tuberculosis, With Special Reference to the Use of Tuberculin T. R.

TOEROK, ERLIN, New York, (*Archives of Ophthalmology*, September, 1907), after a comprehensive review of the literature on this important subject asserts that he has used tuberculin with excellent results in the treatment of tuberculosis of the eye, and states further that even if it does not cure every case, it will, if properly used for a sufficient length of time, cure the great majority of cases, very often even such as up to the present we have been unable to handle. His observations do not support the objection that tuberculin may have an injurious effect upon the tuberculosis which may be present in other parts of the body, and he believes that it is the duty of every eye specialist to follow this treatment, in preference to any other. Then follows a detailed history of sixteen cases.

H. G. G.

Experiences With Koch's Tuberculin. (Old Tuberculin and Tuberculin T. R.)

BRUECKNER, A., Würzburg, (*Archives of Ophthalmology*, September, 1907) states that in the Würzburg Eye Clinic since 1903 tuberculin has been employed, although its use for therapeutic purposes has been limited. Thirty-eight cases received 53 injections of old tuberculin and 152 injections of tuberculin T. R. The site of the injection for the T. V. was the intercapsular region, and the injection was practiced as deeply as possible into the muscles, T. R. was injected subcutaneously into the forearm. The reaction in this latter location was sometimes severe, but in the former only a moderate redness in some isolated cases was observed. Abstracts of histories follow, of cases in which tuberculin was employed for diagnostic purposes. Twenty-six cases of iritis and iridocyclitis were treated by injection, 12 were acute and 14 chronic. Local reaction in the diseased region itself was observed in only 3 cases.

In 4 cases of parenchymatous keratitis the tuberculin injection resulted positively, in 3 without local reaction; in two cases of disseminated chorioiditis one presented no reaction, the other a very marked reaction. A negative case was one of indefinite neuroretinitis, also one of retino chorioiditis which was complicated with hemorrhages and detachment of the retina.

H. G. G.

A Pathognomonic Eye Symptom in Rabies.

COAKLEY, W. B., New York, (*New York Medical Journal*, July 6, 1907), describes a pin point contraction of the pupil which was uninfluenced by light or by drugs, but gave way to dilatation before death, that he has met with in rabid dogs and considers pathognomonic. Attempts to locate the cause of the contraction by examination of the brain and cord during life were fruitless. Attempts to produce a similar contraction of the pupil in normal dogs by means of drugs also failed. The clinical and pathological findings in the eyes of 114 rabid dogs are given in tabulated form.

M. L. F.

Is Miners' Nystagmus of Labyrinthine Origin?

PETERS, A., Rostok, (Abridged translation by Foster, Matthias Lanckton, *Archives of Ophthalmology*, September 1907), claims that disturbances of the ocular muscles are causative, but does not believe that they form the one aetiological factor of Meniere's nystagmus. A satisfactory explanation of their participation in various central affections is to be found in the conditions of circulation and nutrition of the nuclear region of the eye muscles, and that involvement of the ear, with particular reference to Meniere's symptoms, is very doubtful. He believes that more importance should be ascribed to the psychical co-action, which seems to be indispensable to the occurrence of vertigo. In many cases ocular vertigo quickly follows diplopia and false projection, although diplopia obtained by simple mechanical displacement of the eyeball is not accompanied by vertigo because the psychical factor enters and acts as a regulator. He states that the ability to work eight hours or more with the eyeballs directed upward can be obtained only through a compensatory backward tilt of the

head, and that in such a tilt is to be found the influence which causes the non-appearance, or late appearance, of the symptoms of fatigue. He argues that a redistribution of the endolymph in the vestibule is produced by gravitation when the head is bent backward as a compensatory movement to a certain upward movement of the eyeballs. If this marked backward movement of the head is maintained for months and years for eight or more hours a day, a new condition of equilibrium will be brought about to a certain degree in which the backward head and the upward turned eyes will have adjusted themselves to the position of the rest of the body, which is one more or less vertical. If now with the return from work the position of the head and eyes is changed to the upright, an irritation in the vestibule will be caused by the change in equilibrium which may be manifested in a reflex manner from the central apparatus to the eye muscles. H. G. G.

Diseases of the Eye, Ear, Nose and Throat Among Persons Afflicted With Leprosy.

HOLLMANN, H. T., (*New York Medical Journal*, Oct. 26, 1907), the Assistant Medical Superintendent of the Leper Settlement at Kalaupapa, Hawaiian Islands, gives the following resumé of the leprosy conditions he has found affecting the eye.

Ptosis.—I have found four cases with ptosis of the eyelids due to the bacillus of leprosy affecting the entire oculomotor nerve. In one of the cases a complete cure resulted through the removal of an elliptical piece of the lid and suturing the edges together.

Ectropion or Eversion of the Eyelids.—There are fifty-five lepers suffering from more or less ectropion. In some of the cases there is complete ectropion exposing the whole inner aspect of the lower eyelid, in others it is as yet only partial. Ectropion in these cases is due either to the cicatrices of healed leprosy ulcerations drawing down the eyelid, or to paralysis of the fifth or seventh cranial nerves. In ten of these cases in which I have been allowed to operate there has resulted a complete cure of the trouble. In some cases von Graefe's operation was performed, in others the strip removed was from the horizontal plane.

Oedema of the Lids.—As the result of severe leprous conjunctivitis we have an associated oedema of the eyelids. We also have found some cases where the oedema was unquestionably due to renal disease, probably leprous in character.

Tubercles.—In many cases of the tuberculous form of leprosy we find the formation of tubercles in the eyelids. If small and not too numerous, they cause little or no interference with the functions of the eyelids. When the tubercles become too large, their complete removal is indicated.

Symblepharon.—As the result of violent leprous conjunctivitis we have in a few cases an adhesion between the eyelid and the ball of the eye.

Simple Ophthalmia.—This occurs among the lepers much more frequently than among normal individuals from the fact that there is more or less anaesthesia of the parts, the eyelids fail to recognize the presence of any irritating substance, and the irritating substances are not washed away by the tears, causing finally a severe ophthalmia.

Leprous Ophthalmia.—By the name of leprous ophthalmia I mean those cases of ophthalmia that are due to true leprous involvement of the conjunctiva, causing a resultant ophthalmia. The formation of leprous tubercles in the chorioid coat of the eye I am convinced is one of the principal causes of this leprous ophthalmia.

Ophthalmia Neonatorum.—I am sorry to say that we find a few cases of ophthalmia neonatorum. All of which, however, have recovered under proper treatment.

A Leprous Pterygium Like Pannus.—There is among a few of our patients a peculiar condition which I can only describe and not name as I can find nothing analogous in any textbook on diseases of the eye. For convenience sake I have called it a leprous pterygium associated with pannus. It starts undoubtedly as a leprous tubercle of the chorioid coat which finally disintegrates and ulcerates externally, subsequently from this point a hypertrophic overgrowth extends to, and gradually involves the cornea. It is plentifully supplied with bloodvessels, hence a condition of pannus. When once it has completely involved the cornea, there is no hope for vision, except possibly through an iridectomy. If the condition is seen in time we

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can arrest its progress, but for how long has been only for the last year that we rest it.

Cornea Ulceration.—On account of the of the cornea due to involvement of the cornea by the leprous growth, we find this ulceration in certain debilitated creeping ulcer of Sämisch and the ulcer

Vascular Keratitis occurs as before in other cases that have a beginning opacity at the corneal margin, and gradually extend over the cornea.

Iritis.—In a certain percentage of the ccurring an iritis, which seems to be caused by a syphilitic or cachectic involvement of the parts. In others it is purely syphilitic or cachectic.

Chorioid.—We find in the chorioid coarsely granular tubercles, which appear as small rounded nodules occasionally by a slightly inflamed surface. It is very difficult to discover these small tubercles requiring repeated ophthalmoscopic examination of the chorioid when of a large size often visible externally.

Retinitis.—Leprous retinitis in a few cases, with a termination in a complete blindness, suffering excruciating pain. In a few cases, comitant with a formation of an opacity at the periphery of the cornea.

Refraction Among the Lepers.—At the present time we depended entirely on glasses of either cylindrical or spherical lenses, such as are always in stock, for the lepers. This was a slight help to them, but it was not continued, as we now intend to thoroughly examine the eye with the ophthalmoscope and thus accurately determine the refraction, in cases of pannus, retinitis, synechia, and various other disorders of the eye. It is undoubtedly very complex lenses and in many cases the refractor. Yet how great will be the benefit to the unfortunate leper.

A Case Showing Increase of Hyperopia During Marked Glycosuria

SAUNDERS, R. R., Philadelphia, (*Ophthalmic Record*, June '07), reports a case of increased hyperopia during marked glycosuria in a woman 60 years old. She was first treated for conjunctivitis from which she soon recovered. In November '01 she came for refraction; examination showed the media to be clear, the disks small and round, the vessels and fundi normal. This and all other refractions were done without the aid of a mydriatic.

O. D. V. = $5/30 + 2.25$ sph. $\odot + .25$ cyl. ax. $90^\circ = V. 5/3$.

O. S. V. = $5/30 + 2.00$ sph. $\odot + .25$ cyl. ax. $90^\circ = V. 5/3$.

For near vision + 2.50 sphs. were added and the correction worn for over two years when the patient complained of blurred vision. Refraction was again taken and the findings were practically the same. October 5, hyperopia had increased to + 4.50 sph. in each eye. She had suffered from a constant thirst and itching of the skin which had become dry and harsh, together with pain around the back and was losing weight. Examination of her urine showed specific gravity of 1.040, abundance of sugar, and no albumin; after fermentation the specific gravity dropped to 1.008. Her condition improved under dieting and treatment. Refraction was taken four times between Oct. 4, and Nov. 23, and the specific gravity of the urine measured alternately, the changes in each being very decided and seemed to be closely related. After four months treatment and a week of unrestricted diet the urine showed a specific gravity of 1.015. She discontinued treatment, but returned in a few weeks when dieting and treatment were resumed until the urine was free from sugar and had a specific gravity of 1.018.

When seen three years later the urine contained much sugar and showed a specific gravity of 1.020 before, and 1.000 after fermentation for 24 hours. Refraction was,

O. D. V. = $14/30 + 2.50$ sphr. = $14/10$.

O. S. V. = + 2.25 sphr. = $V. 14/10$.

With + 3.00 sphs. added to this she was able to read J. type No. 1 at 13 inches. O. W.

Examination of the Eyes of the Pupils in the Public Schools of Memphis.

MINOR, J. L., Memphis, Tenn., (*New York Medical Journal*,

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Aug. 3, 1907), gives the following report:

The entire number of pupils examined the whites contributed 3,181, 2,685 with imperfect vision, 89 of whom were absent from my examination, leaving 376 whom I did examine. The negroes contributed 1,849, 1,726 with perfect vision, 40 of whom were absent from my examination, leaving 83 whom I saw.

Two white pupils with perfect vision I saw when they first came to school. They saw the world upside down, and in their efforts to write, to draw, etc., persisted in attempting to do what the teachers had given these children—boys and girls—much personal attention and care, and in cultivating them to see, and represent things as they are. This course of several months. I saw them and they could learn nothing but what the teachers taught. This was a combination of timidity, obstinacy, and ignorance, which caused me to think that more than “inversion”, had been the cause of their error, not shared by the teachers.

Among the imperfectly seeing pupils, 20/200 in right eye, better sight in one eye than the other, best in right eye, 155; best in left, 50.

Among the whites examined by me were 10 cases of corneal opacity in each eye, with average vision 20/200; two boys and two girls, 20/70; two cases of heterophthalmia (hypermetropes); one case of albinism (hypermetropes); one case of nystagmus (irregular corneae); one case of strabismus (symmetrical), down and out—hypermetropic; one case of cataract through lens; one case of zonular cataract; one case of optic neuritis, v 20/200 (left); one case of phthisis bulbi (left), w 20/200; one case of myopia, v 20/20; ten cases of strabismus in boys and six girls, in nine cases the left eye was right, average vision in nonsquinting eye, 20/150 (uncorrected), all hyperopic; one case of strabismus divergens, each eye myopic, 3.00 diopters. There was practically, a relative di-

pia, and increase of myopia, from the lowest to the highest grades, which would have been more pronounced with a larger number of pupils and would probably have been supplied by the eighty-nine absentees seeing badly.

Among the blacks examined by me were: Eight cases of corneal opacity, each eye, with average vision of 20/100, three boys and five girls; one case of retinochorioiditis in each eye with vision of 15/200, in a girl ten years old, of strumous diathesis; two cases of one sided phthisis bulbi (left), with corneal scars in good eye, and vision of 20-70 in each instance; no cases of strabismus, or other than refractive errors and such as have been referred to, were found. Not a single case of myopia. Rarity of myopia in the race is to be anticipated, for they, as a rule, subject their eyes to but little strain, and are but slightly educated, but when the negro pupils are examined under the same conditions that apply to the whites, and grade after grade is passed without finding myopia, there is evidently something wanting, and that is, the predisposing cause already referred to, i. e., a long line of educated ancestry.

The blacks were not only free from myopia, but their average for perfect vision was two and a half times as great as in the whites, the proportion of badly seeing whites being 1 to 6; of blacks 1 to 15.

M. L. F.

The Cause of Difficulties in Refraction Work.

DIXON, LEWIS S., Boston, Mass. (*Ophthalmology*, July 1, 1907), writes that some years ago an attempt was made, by the constant use of overstrong convex glasses, to produce artificial myopia in certain obstinate cases of eyestrain, hoping to obtain some of the freedom from asthenopia which simple myopes always enjoy. Many of the results were very satisfactory and one thing was found very frequently, viz. that the artificial myopia thus produced would after a time disappear and the asthenopia recur. If myopia were again produced by using stronger plus lenses, the condition of myopia would remain permanent with freedom from distress and increased ability to use the eyes, though distant vision was limited.

Case I. Under atropine accepted + .50 sph. \ominus + .50 cyl. ax. 180° O. U. with V. = 28/18. Continued asthenopia compelled the use of atropine twice more and homatropine three

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times; leading to increase of convex glass. Constant practice became + 2.25 sph. + 50 c sph. + 1.50 cyl. ax. 175° V. + 28/24 and entirely comfortable.

Case II. After three examinations unpetent oculists came wearing + 1.75 sph. After several years practice with increasing learned to see 28/24 with + 4.00 sph. + .50 base in, and + 4.50 sph. + .25 cyl. ax. 10 to correct a previous unnecessary tenotomy comfort.

Case III. After three competent tests sph. O. U. V. = 28/20. Stronger glasses brought till at last he became permanently comfortable with + 4.00 sph. + .25 cyl. ax. 90° O. U. V. + 28/20

Case IV. Wears + .50 sph. O. U. V. + 1.00 led him to accept + 1.75 sph. and + 1.00 Time and practice led to the use of + 4.00 V. = 28/30. Later he returned from travel and received + 4.75 sph. and + 3.75 sph V. = 28/24. and for three years he has been able to use his eyes freely.

Case V. Wears + .50 sph. + .37 cyl. Time and practice with changes show entirely comfortable 28/30 with + 4.25 sph. + .37 cyl. ax. 90°

Many cases like these have shown that accommodation can be taught to relax much voluntarily or by mydriatics. It requires practice to entirely overcome the original habits involved in accommodation which have been used every waking moment since birth. Interesting experiences seem to show that positive strain depends not upon clear vision, but upon constant use of correcting glasses or acceptance of the convex element. Like all forms of accommodation require rest for the eyes and excessive strain.—The myopic eye, seldom or never overstrained, so artificial strong convex lenses may produce the same

tive errors are but partially corrected, actual rest for the ciliary muscles is impossible, for the demand for clear vision and the attendant activity of that muscle is imperative. Yet it is common and in fact the rule for oculists to undercorrect their patients. Comfort and freedom in the use of the eyes does not depend upon good, but upon easy vision. No strain, fatigue or nervous reflex can come in or from eyes whose focus is in front of the retina, which is the case with the natural or artificial myope. Even imbalance of the ocular muscles drops rapidly out of notice when early full correction is given and accepted as in case II. It would seem therefore to be the plain duty of the oculist never to neglect the slightest indications of fatigue or nervous reflex from the eyes: to seek persistently to find error and correct it: for none can be found that does not exist, but can exist that is not easily found, yet capable of doing great harm. If slight indication of eye strain persists the oculist should insist upon constant wear and give increasingly stronger glasses as fast as they become clear for distance. No one can ever learn to see through a glass really too strong; no one will ever voluntarily drop his old habits of accommodation completely unless urged to do so; nor can he learn to accept full correction, if such is not given and practiced with. This should be persisted in until relief comes and distinct distance vision be considered entirely secondary to needed comfort and ease.

A. F. A.

The Inaccuracies of Test Lenses.

BYERS, W. GORDON M., Montreal (*Ophthalmic Record*, July, '07), calls attention to the inaccuracies of test lenses and reports gross errors found in both English and American lenses. In a case of English test lenses there were

- 11 spheres off center 1 mm.
- 7 spheres off center 2 mm.
- 3 spheres "away off" the center.
- 12 cylinders off their axes.

In the American case of test lenses there were 11 spheres off center 1 to $1\frac{1}{2}$ mm.

- 5 spheres off center 2 mm.
- 6 spheres off center 3 to 7 mm.

25 cylinders off in axes varying from 2; cylinder was off axis 40 m.

The examination of these lenses was made in Montreal at the request of Dr. Byers, who is one of the manufacturers of the American lenses and who guarantees the correct centering of the lenses. The firm absolutely refused to do. The firm referred to is known in America, and the number and quality of its work, in Dr. Byers' opinion show the high workmanship in the American optical business.

The Astigmatic Lens (Crossed Cylinders) to Determine the Principle Meridians of Astigmatism

JACKSON EDWARD, Denver, Col. (*Ophthalmology*, '07) in an article on the astigmatic lens says: "*sensory impressions are perceptible and sudden as they are sudden.*" In subjective testing the result much depends on the suddenness of the change. Recognition of this condition of accuracy requires the use of supplementary spherical lenses. This is the more important in estimating astigmatism. The astigmatic lens first described by Stokes is the

"The astigmatic lens has with regard to the action of a convex cylindrical lens, and with regard to the action perpendicular to the former the action of a concave cylindrical lens of equal refractive power. Such a lens is obtained by combining either convex and concave cylindrical lenses of equal refractive power, with the axes perpendicular to each other, or of one kind with a cylindrical of the other kind of equal strength."

Stokes and Dennett suggested a modification of this lens and proposed to use it alone. The writer has used it as a supplementary lens, and he had used it as a trial frame. He illustrates its use and quotes Maddox' method of using it.

When this lens is used in the trial frame the cylindrical already in the frame is modified by the addition of the astigmatic lens parallel to its axis and the result is used to determine the direction for the cylindrical

the astigmatic lens should be placed at an angle of 45° with the axis of the lens in the trial frame. The advantage of the astigmatic lens is that its rotation is absolutely sudden, so that the impression made with the lens in one position has not time to fade from the retina before the other position is presented.

With this lens the probabilities of inaccuracies are much less than with the ordinary trial cylinders.

This article should be read to be appreciated.

O. W.

ABSTRACTS FROM ENGLISH OPHTHALMIC LITERATURE.

(Great Britain and the English Colonies.)

BY

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The Prism-Verger: An Instrument for the Measurement, and Enlargement of Fusion Power.

MADDOX, E. E., (*Ophthalmic Review*, April 1907.) This new instrument as devised by Dr. Maddox is described in full with directions for its use. It can be used:—

1 For the determination of vergence power, both horizontal and vertical.

2 For the enlargement of vergence power to correct esophoria, exophoria or hyperphoria.

3 To treat slight squints by exercise.

4 To measure heterophoria.

W. E. B.

A Histological Study of the Normal Healing of Wounds After Cataract Extraction.

HENDERSON THOMSON, (*Ophthalmic Review*, May 1907.) This paper is based upon the microscopic examination of 33

aphakic eyes and is accompanied by plates illustrating the cases reported in the paper. It does not readily admit of being abstracted. W. E. B.

A Case of Epibulbar Sarcoma.

FOSTER J. R., (*Ophthalmic Review*, June 1907.) The patient, a boy, was first seen when four years old for a small dark growth slightly raised above the conjunctiva on the outer side of the right eye-ball and freely movable on it. It had been present since birth but had recently increased in size. It was thoroughly removed, and microscopical examination indicated it to be a congenital mole. Five months later it recurred and appeared as a small red nodule a little below site of original growth, more circumscribed and more raised above the surrounding tissue and smaller in size than the primary growth. This was also freely movable on the globe. It was again thoroughly removed and microscopical examination showed it to be undoubtedly sarcomatous. At the time of his report two years and two months after the second operation the boy is well and strong and shows no sign either generally or locally of any recurrence. W. E. B.

The Histology of Iridectomy.

HENDERSON, THOMSON, (*Ophthalmic Review*, July 1907.) From the microscopic study of a series of cases he arrives at the following conclusions:—

"The severed iris tissue after iridectomy never shows any signs of scar, or other manifestations of reaction, for, even years after, the cut surface appears as if the operation had been performed post mortem.

Cicatrization, in general is the expression of there action of the tissues to trauma and irritation. It is in fact a defensive and protective bulwark arising from the altered relationship and surroundings of the tissue affected. In the case of the iris, however, there is a peculiar and unique state of affairs, as here the tissue concerned is composed of a vascular layer of loose connective tissue which is bathed and surrounded by lymph; a simple trauma therefore, such as iridectomy, does not in itself alter the relation of the severed tissue-cells, either

to each other, or to their normal surroundings, so that there is no stimulus to cause the cells to hypertrophy and lay down a dense and protective layer. When, however, a stimulus is supplied by toxic or other agents cicatrization and sclerosis of the iris tissue follows in the same manner and governed by the same principles as elsewhere in the body."

A Case of Reticular Opacity of the Cornea. (Gitterige Keratitis, Haab.)

PATERSON, J. V., (*Ophthalmic Review*, August 1907.)

This form of corneal opacity appears to be very rare. The appearances in a typical case are very striking. Haab looks upon it as a degenerative and not an inflammatory process. As a rule the writer thinks the disease appears to progress slowly and finally to cause very great diminution in the acuteness of vision. Nothing is really known of its pathology. Its occurrence in several members of the same family is very noticeable. His patient was a widow 48 years old who had noticed the defect in her vision for $2\frac{1}{2}$ years. Her present history is negative and there is nothing in the family history to indicate that any other members of it suffered from a similar affection. The left eye is quite free from injection or other signs of irritation. (On the left cornea, most marked towards its centre, a number of irregular, wavy, branching and anastomosing grey lines are visible, forming an irregular meshwork.) Towards the centre of the cornea the lines are rather broader and their edges tend to fuse, forming a considerable opacity. This is intensified by the presence of a faint haziness of the cornea in this region. Under a magnification of 10 to 20 diameters the lines are seen to lie very superficially, apparently just under the epithelium, which is raised over them and shows slight stippling. The general haze is found to consist of very fine grey dots, the position of which is perhaps not quite so superficial as that of the lines. There is no sign of vascularization, recent or old, and the conjunctiva of the lids is quite normal in appearance. The lines can be traced nearly but not quite to the corneal margin. LV = 6/24: fundus normal. In the right eye only a few irregular lines are visible on the cornea: no trace of haze. The lines are identical in appearance with those seen on the left cornea V with 0.5 cyl. horiz. = 6/9.

W. E. B.

A Preliminary Communication on the Pathogenesis of Glaucoma and the Rationale of its Treatment.

HENDERSON, THOMSON, (*Ophthalmic Review*, September 1907.) The underlying predisposing and causal factor of glaucoma exists in a primary obstruction and closure of the pectinate ligament. This occlusion is brought about by a sclerosis of the fibrous structure, composing that filtration area, which results in first a diminution and finally a complete obstruction of the outflow through that channel. All the other phenomena of glaucoma clinical as well as pathological follow as consequences of this primary closure of the pectinate ligament.

In the histological difference between the structure of the pectinate ligament in the eye of a child and of an adult is found the key to the pathogenesis of primary glaucoma.

Glaucoma arises from a difficulty in the escape of the intra-ocular fluids. The hinderance to the aqueous outflow does not arise from the peripheral anterior synechia frequently met with but is brought about by the closing of the inter-spaces of the pectinate ligament in consequence of the fibrosis of the cells of its connective tissue stroma and continued formation of homogeneous membrane around these fibrous bundles, leading to the endothelial cells being first brought into contact and then welding together the fibrous structure.

The iris subserves an essential role in the internal economy of the eye by acting as an absorbing surface accessory to, but no less important than the pectinate ligament itself and its loose stroma and large blood supply are admirably adapted for this purpose. This action is especially marked where the crypts are most numerous.

The balance between the inflow and outflow of the aqueous is deranged in glaucoma by the available filtration area through the pectinate ligament being first diminished and finally closed, thereby throwing a greater proportion and finally all the work of the drainage on the iris. The superficial and absorbing surface of the iris varies inversely with the size of the pupil, but more important than the mere superficial area is the fact that with a dilated pupil the iris crypts are closed, while with a contracted one they are opened and so allow of free drainage.

Acute glaucoma is precipitated by mydriasis or by mental or physical conditions which increase the general or local blood pressure in an eye predisposed to glaucoma. The raised intra-ocular pressure causes increased difficulty of venous return and as a result the iris becomes congested and applied to the pectinate ligament and so blocks the angle of the anterior chamber. In subacute glaucoma the same agencies are at work, only the balance between inflow and outflow is kept more even, each attack causes more of the swollen iris to become applied

and then adherent to the posterior surface of the cornea. In chronic glaucoma the process of sclerosis is a slow one, and at the end such an eye may still show a perfectly open angle of the anterior chamber with a pectinate ligament which is sealed up. It is in the fact that the iris is an absorbing surface that medical and surgical measures depend for their success. The beneficial action of myotics is therefore to be accounted for, by their causing contraction of the pupil and so opening out the crypts on the iris surface, thereby allowing the aqueous to find a way out. After an iridectomy the iris stump shows no signs of a cicatrix. The operation opens up a permanent channel for the intra-ocular fluids to drain away.

The only difference between the various forms of glaucoma is one of degree, as the same pathological process underlies them all. In secondary glaucoma a similar obstruction is brought about by inflammatory products. W. E. B.

Two Unusual Forms of Amblyopia.

MCMILLAN, LEWIS, (*Ophthalmic Review*, September 1907.) In one patient, a man age 49, the vision failed in two days time after the use of a local anesthetic which had been used (four times within two months, three times being 15% cocaine and once 20% stovaine) for cautery applications to his nasal mucous membrane. Examination indicated retro-bulbar neuritis apparently toxic in type which the writer thought due to the cocaine. Under appropriate treatment including stoppage of tobacco the patient gradually recovered his vision with simultaneous disappearance of the central scotoma, though before recovery he had returned again to the use of tobacco.

The second case, a young lady aged 23, presented the symptoms of an acute retro-bulbar neuritis which he thinks was due to watching a very severe thunder storm for several hours the evening before the attack came on. Recovery was complete.

W. E. B.

Notes on a Case of Episcleritis Periodica Fugax.

SMITH, EDWIN TEMPLE (*Ophthalmic Review*, October 1907.) This disease is rare. The author regards it as identical with the subconjunctivitis of von Graefe. He gives a detailed history of a patient, and of five attacks which he watched from onset to recovery, and after a full discussion of this case and the disease in general arrives at the following conclusions:—

1. "That episcleritis periodica fugax may exist in a severe form without any exudation of serum or round cells into the sclera, or overlying tissue.

- 2 That a period of depressed general health precedes the attack.

3 That the affection may be para-gonorrhoeal (to use an analogy with syphilis) in origin.

4 That in such cases, quinine in full doses is of more service than so-called anti-rheumatic remedies.

5 That in the way of local treatment, warmth and protection are all that is needed; drugs which act on the pupil being unnecessary and probably harmful.

6 That the disease is not merely a mild and fleeting form of episcleritis, as suggested by many authors, but a distinct affection, whose not least prominent characteristic is that the eye is left after the attack in apparently normal condition, both as regards structure and function." W. E. B.

The Treatment of Detached Retina.

DEUTSCHMANN R. PROFESSOR, (*Ophthalmoscope*, August 1907.) In an article contributed by request of the editors, Professor Deutschmann, after discussing statistics of cases treated by operative methods, gives the methods and a partial description of the technique advocated by him and practised in his clinic in Hamburg together with his belief as to the manner of action of the methods, concluding with the desire that they have further trial by others.

After showing that for comparative purposes the statistics do not furnish sufficient data for conclusions as to the value of operative treatments, he says that as palliative treatment is so seldom successful one is justified in trying operative treatment, and that it is one's duty to propose it to the patient. He gives a list of the different operative measures which have been advocated, showing that each has generally failed or been unsatisfactory, while by his own methods, as shown by statistics, the results have been much better.

Professor Deutschmann adopts two methods: one bisection, and the other, reserved for the severest cases, is injection of sterile animal vitreous into the diseased eye.

Bisection is done with a two edged linear knife as a rule downwards, never upwards. It is never used in fresh cases where the detachment is superior, but only after the subretinal fluid has gravitated and the detachment is below.

"One directs the knife tangentially to the eyeball, inserts it in typical cases downward and outward in the anterior boundary of the clu-de-sac and bisects it horizontally through the eye so that the counterpuncture lies directly opposite—thus downwards and inwards. On the spot of the counterpuncture one pierces only the sclera and spares the conjunctiva. The knife is drawn back in the same way, the blade a little turned on the spot of puncture so that the sub-retinal fluid can conveniently flow away." The eye is previously atropinised and kept so during the treatment.

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Anesthesia is secured with cocaine and the patient is bandaged 24 hours after which the dressing is removed and the patient remains in bed.

After the reaction has subsided, the operation is repeated if necessary 10—20 times if necessary, the interval is at the judgement of the operator. If threatened, there is as a rule no danger to the eye if the reaction appears unfavorable to the eye the operation is repeated. On withdrawing the knife the eye is evacuated in which only rarely, are vitreous bodies, therefore the vitreous body is generally

Among mischances, the author court
of a larger retinal vessel, or a hemorrhag
vessel, or lighting up of an old inflam

The second stage of the operation consists of introducing sterile animal vitreous into the eye, a procedure which is used in those cases where all other methods have failed. In such cases the vision is nearly or soon will be lost.

Carried out in a strictly aseptic way, it does not endanger vision and in desperate cases will be saved.

The eye is previously atropinized. Anesthesia is induced with a glass syringe made of Göttingen with a platinum-iridium knife canula (Kanülen Messer), the steel

He uses two preparations which he No. 2. No. 1. is filtration of fresh re-sterilized by boiling in hermetically sealed ampoules (for injections). No. 2 is fresh vitreous body (No. 1) 100 Cent. in vacuo. The residuum is dissolved in water—sterilized by boiling so that it can be used as a concentrated vitreous body (stronger than No. 1). Descriptions are supplied ready for use by the author - Strasse, Hamburg.

Technique. If using the platinum globe is punctured in the region of the top and downward and the syringe held by the operator makes a simple bisection

slowly and carefully injects a small quantity of the contents of the syringe, the amount being gauged by the consistency of the eye. When the syringe is withdrawn, the opening is held closed for a few minutes with toothed forceps that none of the injected fluid may escape.

If using the double edged canula knife, one makes the insertion "in just such a way without previous bisection as with the double edged knife in the simple bisection, that is on the stretched anterior boundary of the lower cul-de-sac; one can introduce the canula up to the spot of the counter puncture." Moving the point of the canula from side to side should be avoided. The subretinal fluid draws away on puncture and the injection is made immediately. Escape of injected fluid is prevented in manner before described.

After operating, both eyes are lightly bandaged, 24 hours afterwards, the operated eye only. Further measures depend upon the reaction, and this depends upon the concentration of the animal vitreous used. One must always begin with the weak preparations and gradually increase to stronger in subsequent operations as the reaction lessens. For the first injection the No. 1. vitreous is diluted with equal parts of sterile salt solution, for the second undiluted vitreous body may be used, and so on.

Reaction is controlled by atropine and warm applications.

In case of marked increase of tension and severe pain, simple bisection may be done to relieve it. The ordinary course is first for the vitreous to become cloudy and then to gradually clear up, even where yellowish and abscess is apparently threatening it will clear in a few months, which result may be assisted by warm applications and an occasional normal salt injection.

The operation is always to be regarded as a last refuge, and the author warns against expecting too much. His statistics show of 67 cases, 3 cured, 26 improved and useable, 38 uncured.

He thinks the method acts mechanically by the drainage of subretinal fluid and by pressure of the retina against the chorioid favoring and causing the forming of inflammatory adhesions.

He admits the possibility of relapses but the treatment may

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on such cases be repeated. He thinks much better than those where other methods he feels justified in recommending it to his trial. The statistics of Horstmann show those of Uhthoff 8.5 per cent. His own of successes.

The contribution is exceedingly interesting. He regrets that more explicit directions were not given as to place and manner of making the incision, and the situation to be chosen for the injection, and the details of the technique, which must contribute to the author's remarkable success with those cases.

Some Notes upon Granular Conjunctivitis

MANCHE CHARLES, of Malta. (*Ophthalmology*, 1907.) In this contribution, the author discusses the contagiousness of trachoma, the differentiation of follicular conjunctivitis, and prophylactic measures to check its spread.

Italian oculists have organized for this purpose the "League against Trachoma". The first meeting was held in Palermo, April 1906. In October 1906, the Ophthalmological Society brought forward trachoma for discussion at its annual meeting. From these meetings and discussions, the author has gathered points of interest.

Contagiousness.—Though no microbe has yet been discovered, there can be no doubt of the contagiousness of trachoma. Recent experiments have shown beyond doubt that a piece of trachomatous conjunctiva introduced in the eyes of the monkey or of man, after three or three weeks an attack of acute conjunctivitis, presents all the characteristics of the disease. It has been proven microscopically by careful examination of artificially infected tissue and of the diseased tissue that it showed the typical characteristics.

He quotes from such experiments by Hess and Rohmer. A series in which three out of four were infected, was followed by experiments by Hess and Rohmer. A

Addario on three blind individuals in inserting trachomatous material in an incision of the conjunctiva of one eye of each derson. This inoculation was followed by typical trachoma extending to the other eye in each case, all six eyes showing full development of the disease in six or seven weeks. Addario concludes that trachoma has been produced experimentally on man both by grafts and by secretion.

The Diagnosis between Trachoma and Follicular Conjunctivitis.—Because of the uncertainty and disagreement as to the separate identity of these diseases, the author emphasizes the importance of clinical anatomico-pathological, and experimental studies to establish their non-identity. He says the communication of Sapmeri and Patellas at these Congresses evidently demonstrates this non-identity, showing that follicular conjunctivitis is non-contagious, leaves no sequelae and disappears without treatment, while trachoma has all these characteristics present. Samperi notes the location of the follicular disease in the lower cul-de-sac, the semi-transparent grayish red color of the prominences, disposed in lines parallel to the fornix in contrast with the granulations of trachoma, which from the first are found on the superior tarsal conjunctiva, invading later the superior cul-de-sac. Samperi denies the contagiousness of follicular conjunctivitis, claiming that it is caused by irritation, by dust, ammoniacal vapors, and other irritants. The disease attacks by preference those having a tendency to lmyphatic enlargements. The disease may be aggravated, he says, by bacteria present in the cul-de-sac but not caused by them.

He caused his own eye to be inoculated by a follicle of this disease without result. A foot note, however, states that Axenfeld was more unfortunately successful and that although there resulted no sequelae, it took a year's treatment to cure his eyes.

Inoculation practised by Mayweg, V. Graefe, and Samperi with the secretion of follicular conjunctivitis was always negative. Petellas' paper agrees with that of Samperi as regards contagion and symptoms as well as with reference to cause and results.

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PROPHYLAXIS.—This is the most subject, especially as regards localities

In many parts of Italy and more choma is frequent and increasing because of unhygienic surroundings, and of insufficient treatment till the disease is cured.

At the Congress held at Rome the following was passed which Scelzingo took it upon himself to present to the Italian Government.

1. Compulsory notification of all cases under the notice of both civil and military authorities.

2. Obligatory presentation of a certificate by persons suffering from trachoma before applying for admission into schools, colleges, army, navy, etc.

3. The opening of outdoor eye dispensaries in the provinces where the disease prevails, as well as in the cities.

4. The institution of schools for the instruction of all the provinces, and the isolation of cases in those places where such schools have not been established.

5. Periodical inspection of all educational institutions, and the diffusion among the people of pamphlets as a means of protecting themselves from the disease.

6. The opening of post-graduate courses for the instruction of both qualified practitioners and also medical officers.

7. The provision of separate wards for patients in hospitals and ophthalmic dispensaries.

The author says that as trachoma is a contagious disease the same provisions to check its progress as are in vogue in Germany, America etc. are quite as applicable here.

The communication is of great practical importance as it does with those features of the disease which are of importance to the welfare of the public.

The Value of Systematic Bacteriological Study in the Treatment of Gonococci

OLIVER, CHARLES of Philadelphia (Philadelphia, August 1907.) For several years past

by daily smears and staining of these cases the author has learned that the virulent types can be governed more easily, the milder forms more speedily cured, and the clinically insignificant ones quickly gotten rid of.

Now, after many methods have been tried, the following plan has been established. Daily or tri-weekly, studies are made and reported in writing. From these findings the continuance or change of treatment is decided. In dubious cases the specimens themselves are submitted with the report.

The following routine and rules are observed:

1. No case is considered specifically certain in character until bacteriological study has proved the presence of the special type of germ.

2. In each case, not only is the presence of the special form of floral cells considered, but their conditions and numbers, their relations to associated germs, and their exact and relative localities, are all taken into account.

3. In every instance, careful consideration is given to the character, the degree, and the amount of the protecting faunal cells, particularly in their relationships with all of the different forms of attacking cells.

4. In every case possible, the state of the resultant debris is searchingly inquired into—both just before the use of the destructive therapeutic agents, and soon after.

5. No case is removed from isolation, no guard over treatment is discontinued, and no relinquishment of the measures which seem to be the most applicable in each individual instance is counterbalanced in any way, until at least three successive and simultaneous negative results as to the presence of gonococci in both eyes have been obtained and decided upon by those who are competent to judge.

6. Whenever possible, every purely local eye case is, even when apparently cured of the ocular expressions of all of the gross forms of dangerous mixed infections, strictly watched and kept in surveillance until every external evidence of the presence of any of the dangerous types of offending germ life with the microscope, has disappeared for a proper period of time (as a rule for about three or four week's time).

7. Every self-infected case is sent to one of the other ap-

propriate departments of the hospital for both general and special study, and is given treatment whenever necessary.

W. R. P.

Ocular Tuberculosis

HANCOCK, W. I. and MAYOU, M. S., (*Ophthalmoscope*, July 1907,) cite nine cases of Ocular Tuberculosis treated by injection of Tubercular T. R. controlled by the opsonic index. The authors present detailed histories of five cases of Tubercle of the Iris with remarks on the dose, frequency of injection, and results of treatment together with histories of four cases of Tuberculous Scleritis with brief conclusions that tuberculin treatment is free from danger in such cases if controlled by the opsonic index and that their results encourage further trial in this intractable disease. In order to differentiate the cases more certainly from syphilis, anti-syphilitic treatment was given thorough trial before subjecting the cases to the tuberculin injections.

The youngest patient treated was three years. The oldest was forty-two. Only one was in the first decade. Five were in the second decade of whom three were aged twelve and two were seventeen. One case of iritis and one of scleritis were twenty-seven and twenty-six and the remaining case, one of iritis, was forty-two.

The first case had an iritis and punctate keratitis following corneal ulcer. No specific or tubercular history. At the beginning of treatment, Feb. 2nd, the Opsonic Index was .81. After two months treatment it had risen to 1.9. June 3rd, discharged practically well.

The second case had a slight dullness at apex of right lung. No other lesion and no specific history. Small iritis, posterior synechia, punctate keratitis. August 4th, O. I. 1.00. Sept. 7, O. I. 2.00. Oct. 4th, much improved. Dec. O. I. had dropped to 1.00 and eye worse. Injections repeated every two weeks. March 29th, eyes quiet O. I. 1.00.

The third case had neither specific nor tubercular history. Sight gradually failing for several months. Multiple nodules both irides. Posterior surface cornea studded with punctate deposits. January 1st, O. I. 1.14. No local reaction. Jan. 29th, dose repeated. Feb. 7th, O. I. .75 (negative phase)

marked local reaction. Feb. 8th, third dose given O. I. Feb. 27th, 1.7. Local reaction after this and each following injection. March 8th, nodules practically all disappeared. April 4th, O. I. 2.1; Injection given. May 5th, slight relapse. For 48 hours after each injection, sight worse, later improving for 10 days, becoming after this more misty. Weekly injections continued to Nov. 1, 1906 when left eye was practically quiet. Right eye presented synechia and other evidences of inflammation. Tuberculin continued weekly. On March 27th, 1907, no nodules in irides, punctate opacities gone and cornea considerably cleared. Left eye, some iris bombe with full tension.

Fourth case. No specific history. Family history of tuberculosis. No personal tubercular history. V. O. D. 6/6, fundus normal. O. S. L. P. T + 1. Three nodules in iris; interstitial inflammation, punctate keratitis, lymph in lens capsule. Iris locally bombe. Jan. 28th, 1906 O. I. .96. Injection: Local reaction marked. Feb. 7th, O. I. .90. Feb. 8th, injection followed by local reaction. Feb. 26th, O. I. 1.8 injection repeated. Feb. 29th, less inflammation. Nodules had disappeared. Further injection March 8th and 28th. April 4th, O. I. 1.45. Eye improved, general health also. May 3rd, corneal ulcer. Eye worse from now on. May 11th, O. I. 9. Cornea worse. Enucleation advised and declined. Patient left hospital.

Case V. Jan. 6th, 1904 O. D. serous iritis. V. = 6/36 O. U. O. D., J. No. 16. O. S. J., No. 12. Jan. 12, serous iritis O. S. No specific nor tubercular history. March 2nd, 1904 nodule iris O. S. June 27th, 1905 three nodules iris O. S. During this time patient on antisyphilitic treatment. Jan. 1905, iridectomy O. D. for iris bombe. Aug 8th, 1905 O. I. .5 Treatment T. R. commenced Aug. 29th, O. I. 1. Considerable improvement two nodules had disappeared. Injection repeated Sept. 1, O. I. 1.25, Injection repeated. .

Oct. 25th, one nodule only. Patient developed iris bombe with tension O. S. Iridectomy, immediate improvement and nodule disappeared. Nov. 27th, O. I. 1.99, injection given. Nov. 31, O. I. 1.25, injection repeated marked reaction after last injections and all subsequent injections. Jan. 3rd, 1906

O. I. 1.99 injection. Feb. 13th, repeated. Feb. 27th, O. I. 1.7. During March, April and May O. I. about 1.9 Status praesens. O. D. eye quiet still punctate keratitis. O. S. eye quiet no opacities, fundus normal.

The authors note the rarity of Tuberculous Scleritis, and suspect that it is probable that many cases called episcleritis are really tubercular. They found the microscope useful in diagnosis and the excision of the nodule beneficial as regards the local disease.

The first case admitted April 2nd, 1906 had enlarged glands of the neck. In O. D. there was a large watery growth below but not involving the cornea which had penetrated the sclera: removal left the ciliary body exposed. Fundus normal. Vitreous clear. O. I. .5 one dose tuberculin. Patient cured.

Second case May 10, 1906. No history of tuberculosis. Nodule above cornea O. D.: Ill defined in outline; vessels dilated. Cornea near nodule opaque and invaded at limbus. No synechia. V 6/6. Fundus normal; Vitreous clear. Aug. 31, piece excised for microscopic examination. Caseation found in the substance of piece: no bacilli found. O. I. 1.00. Nov. 2nd, injection. Wound healed readily. Patient cured save nebulous opacity at upper limbus.

Third case: Admitted Sept. 29th, 1906. No history of syphilis or tubercle. Slight consolidation left lobe of lung behind. Inflammation of O. S. two years previously. O. D. two distinct nodules on sclera at inner side. O.S. large nodules on sclera outer side. Cornea not involved. V. 6/18. Fundus normal. Vitreous clear. Some photophobia and pain. Oct. 17th, nodule O. D. excised. Some caseation but no bacilli found. O. I. .93. Injection. Injection repeated Nov. 3rd. Nodules rapidly disappeared and Nov. 14th, eyes quiet. O. I. .4 March 15th, 1907. Fresh yellow nodule outer side O. D. invading cornea to slight extent. O. I. .5 Nodules cleared up after four injections and patient is well.

Fourth case: Admitted Oct. 24th, 1906. Large nodule with numerous caseating areas in sclera near limbus and diffused one third around cornea O. S. Conjunctiva intact over surface. V 6/6 Q. U. Fundus normal. Vitreous clear. Jan. 4th, 1907 O. I. 1.00. Piece of nodule excised which micros-

copically proved to consist of epithelioid and giant cells. No bacilli present. Tuberculin injection repeated in two weeks. March 29th, large nodule disappeared but a small one had formed below. This was also partially excised. O. I. .69. Weekly injections. A further nodule appeared which after 3 more injections disappeared leaving only a slight injection O. I. 1.00.

The Authors remark that the initial dose should not be more than 1/1000 milligra. They state that the negative phase lasts about two weeks, that for the first week the ocular condition tends to be worse and for this reason, that the opsonic index should be watched, particularly as the local reaction is often absent the first two or three doses. When the index rises, the repetition of the dose may be guided somewhat by the local reaction and subsequent improvement. The reaction shows in about 48 hours by increased injection and inflammatory symptoms. This lasts two or three days followed by improvement up to about the 10th day, when the index is the highest. They advise repeating the injection on the 8th day as the result is better if the index is still rising.

As regards results, early cases offer the best prognosis and the treatment will be less prolonged. Under treatment, the nodules rapidly disappear but in the late cases come inflammatory symptoms are apt to persist. As compared with other methods the results though slow, are considerably better. The dose of tuberculin given these cases varies from 1/1000 to 1/500 milligra. The preparation used was Tuberculin Ruckstand.

While the report adds to the number of cases treated with opsonic control, it is unfortunately not as complete as would seem desirable, and it is notable for absence of records of V. before and after treatment and one can not help the impression that the treatment was given in a somewhat haphazard fashion, though fuller records would probably have shown that this was not the case.

W. R. P.

ABSTRACTS FROM GERMAN OPHTHALMIC
LITERATURE.

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**Tuberculosis as a Cause of Chronic Inflammation of the Eye and
Its Adnexa, Especially of Chronic Uveitis.**

Stock, Dr. W., Freiburg, (*Archiv f. Ophthalmologie* L.XVI—I). This work contains the results of five years experimentation and study, undertaken in the hope of throwing some light on a field in which there is still much obscurity regarding the course and the treatment of chronic inflammation of the eye and especially of the uveal tract. Notwithstanding, v. Michel's claims, the general recognition of tuberculosis as a frequent and important factor has been long delayed. The clinical evidence has not been sufficient for a conclusion and the tuberculin diagnosis is limited because a conclusive local reaction occurs rarely. The author has undertaken therefore to produce the changes in the eyes of animals by the introduction of tuberculous material through the blood channels. He has watched the development and course of the process for years and has made pathological examinations at different stages. The conclusions thus reached in the study of the

most varied lesions, appear to offer valuable information which may be available in the study of parallel conditions in the human eye.

In the introduction, the author sketches briefly the progress of thought from v. MICHEL'S first radical assertions to the present time, showing the diversity of opinion among competent observers and the actual lack of evidence.

I. Experimental part. The records of 45 animals are given, selected as of especial interest, from previous reports made by the author during the progress of his work. For details and methods reference must be made to the original, as it is possible here to give only a summary of results.

The animals that died lived from 11 to 600 days. Changes in the eyes were noted first after 11 days. In the first infection, all parts of the uvea seemed equally susceptible, later the chorioid near the equator and next to that, the sclera, seemed the points of preference for the tubercle bacilli.

The different parts of the uveal tract are considered separately.

A. Iris and cornea. As the first symptom of a hemogenous tuberculosis of the iris, is seen a slight thickening of the entire tissue; after three or four days, a few gray areas are noted. These nodules may appear in any part of the iris but they are most conspicuous on the pupillary margin. These nodules are not all of long duration, some lasting from four to ten days and leaving no microscopic trace. Others continue to enlarge until, even if they disappear, they leave a distinct trace. In many animals, in the course of repeated eruptions of tubercles, the entire tissue becomes hyperemic, with newly formed vessels until the whole iris has the appearance of granulation tissue, with secondary opacity of the cornea and ciliary injection.

The reinfection of other animals by inoculation with bits of iris tissue and the presence of bacilli proved that the nodules were not due to foreign bodies nor to the action of dead tubercle bacilli which may cause an iritis not distinguishable at certain stages from true tubercular iritis. In certain of these reinoculations the second eye did not develop tuberculosis although bacilli were present—they were evidently too few to

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overcome the resistance of the tissue, therefore, that a negative inoculation was no tuberculosis in the first eye and human eyes to use animals which are guinea pigs.

The technic of inoculation in these detail. An important conclusion re attenuated tuberculosis does not exist means of the blood current may perform and that reinoculation from such chamber of another animal may cause

The microscope showed that nodules composed of mononuclear round cells and finally only after months, giant cells in the early stages, the nodules may disappear microscopic change, unless there has been. Bacilli were rare in the early stages and the more malignant forms. In one case diffusely infiltrated, the endothelium deposited precipitates; the membrane of Descemet's vessels traversed the entire stroma. either in the cornea or at its margin. thorough search, no tubercle bacilli were found. The conclusion reached, therefore, is that the toxins from the severe nodular iritis may be that such a condition may be capable of returning to normal if the source of the irritation is removed. very different prognosis from those cases in which has appeared at the margin as a scleritis.

It seemed that tubercular iritis throughout the whole a tendency to recovery; that this was due to the protective action of the iris during an iridectomy so that the bacilli were removed from the anterior chamber, and in one case, the crop of nodules and a much more rapid recovery of the disease.

B. Ciliary body. The ciliary muscle body is not well developed in rabbits

precipitates and vitreous opacities was not obtained experimentally.

C. Chorioid and sclera. 10 to 14 days after infection, in certain rabbits, a crop of tubercles made its appearance in the chorioid and in 8 to 14 days, most of these had disappeared, leaving no trace, in others an atrophic spot remained with some pigmentation, in others the exudation lasted longer and in some of these, as far forward as could be seen, the floor became excavated and a protrusion of the sclera became visible externally. The conjunctiva over this prominence appeared edematous and infiltrated; it advanced to the corneoscleral margin with the appearance of a gelatinous scleritis. In some cases, progress ceased here, in others it went on to perforation, and in two cases, sclerotizing keratitis developed slowly with nodules in the cornea. This process took at least six months. Cases were noted in which the scleral protrusion was the first sign of intraocular tuberculosis, without vitreous opacities or visible chorioidal changes.

The minute description of late changes in the chorioid and retina is interesting but must be read in the original. The variety of the lesions is great with a tendency to a cessation of activity in the earlier stages. Those that progress may come to a standstill at any point, leaving retinal or chorioidal scars, or may advance to perforation. The general tendency seems to be towards an involvement of the sclera.

D. Conjunctiva. In one animal, a typical small tubercle appeared at the corneoscleral margin, similar to those produced by Bruns by the injection of a dead culture. In another case, tubercular ulcers of the conjunctiva of the upper lid occurred but the possibility that these were the result of a secondary infection (not hematogenous) is suggested.

E. Lids. In one animal, two small nodules appeared involving the Meibomian glands, only to be differentiated from chalazion by the presence of tubercle bacilli.

II. Clinical and pathologic-anatomic part. 1. Attempt to establish the etiology of chronic uveitis in man.

The author draws a clear picture of the familiar chronic disease of the uveal tract, which gives no clue to its origin and has resisted all treatment. With a view to the investigation of

this insidious disease, he has followed a suggestion of Axenfeld, and has inoculated the anterior chamber of rabbits with the portion of iris removed by iridectomy in 15 cases of chronic uveitis, but in no case, was there any reaction, either because the disease had become quiescent or because too small a portion of infectious material was obtained. One guinea pig also gave a negative result. The inoculation of aqueous humor also was unsuccessful, even in one case where tuberculosis was believed to be present.

The author then reviews briefly some of the reports of eyes which have been examined microscopically after enucleation for chronic iridocyclitis, and to these adds 8 cases of his own. In none of these eyes was it possible to find tubercle bacilli. He found, however, in one eye positive signs of tuberculosis and in three others, probable evidence of the disease.

There follows an interesting discussion of the use of "Alttuberculin" for diagnosis. Reference is made to Weiss' comprehensive review of the work done in this field during the past year (1906) and Koch's rules for the use of tuberculin (T. R.) are given in full. (Quoted from the same article.)

The author's methods with a few exceptions, are similar to those recommended by recent writers in this country. The diagnostic dose is at first 1 mg., except for children, then 5 mg., and finally 10 mg.; but in the great majority of cases, it was noted that those who did not react, either subjectively or objectively to 1 mg., gave no sign of tuberculosis with higher doses. If the temperature in the axilla was constantly 36.5 C., then a rise to 37.2 C. may be considered a reaction and a repetition of the small dose which caused it will probably produce a greater reaction. The author considers Alttuberculin correctly given, entirely without danger; he has, therefore, given it to 65 patients without obvious tuberculosis and obtained a reaction in 18 cases. He concluded from this that about 30% of the average population in Freiburg has an active form of tuberculosis; two of these patients had tuberculosis of the tear sac which was examined by Axenfeld.

Among 14 patients with parenchymatous keratitis, 8 reacted to tuberculin. In 19 cases reported by Enslin, 9 reacted. In 11 cases of Enslin's with congenital syphilis, only one reacted.

3 with syphilis and tuberculosis all reacted as well as 5 which were suspected of tuberculosis alone. In only one of the 14 cases reported by the author was it evident and this case did not react nor did 2 other cases of suspected syphilis, while one case of acquired syphilis gave a positive reaction. One of the remaining cases had had suppurating glands, probably tubercular, but did not react, which elicits the statement that cases occur which do not react even with severe tuberculosis. In 23 cases of "scrofulous appearance" with chronic keratitis of various kinds—pannus, phlyctenulas, etc., 20 reacted. The author does not conclude that phlyctenular conjunctivitis is tubercular, but suggests that a form of tuberculosis of the conjunctiva may exist which at some stage may resemble a phlyctenular eruption; in support of which the rabbit mentioned above and a case of Axenfeld's reported at the Ophthalmologic Congress at Lisbon are offered.

The main group of cases in which tuberculin was used was composed of 76 patients with chronic uveitis, with undetermined etiology; of these 45 gave a general reaction; of these 7 cases—4 iridocyclitis and 3 chorioiditis, showed a local reaction at the time of the febrile movement. These figures show a striking similarity to the percentage given elsewhere by Reuchlin and Bruckner. In no case was the local reaction severe as it has been described by v. Michel; in one instance, the precipitates became more numerous. Such changes indicate an undoubted local reaction, as do ciliary injection or photophobia in a hitherto uninflamed eye, but if the eye was red, such changes are to be regarded with caution. A general reaction in the presence of eye disease not otherwise diagnosed is regarded as strong evidence that the ocular condition is tubercular. A consideration of the various forms of nodular iritis leads to the conclusion that the appearance or site of the nodules alone does not permit a diagnosis, but the author has seen very small gray nodules in the smaller zone of the iris, hardly visible without the binocular loupe which he considers characteristic of tuberculosis. These nodules have been seen only in those cases reacting to tuberculin.

Six cases of typical scleritis, were given a tuberculin test and three reacted, one with marked local reaction. In this case

vision was normal and the only marks were those of an old healed, deep scleritis without any congestion. With .5 mg. tuberculin, these scars became deeply injected, showing the latency of the condition and explaining the tendency to relapses.

Seven cases have been treated with tuberculin (T. R.) and the results are almost uniformly favorable. In one case of iridocyclitis, after 18 inoculations in four weeks, highest dose 3/500 mg. Vision from fingers became 7/20. The prognosis is best in the cases of iridocyclitis, where vision is impaired chiefly by the opacities of the vitreous which seem to disappear rapidly under the treatment.

The method used in giving the tuberculin (T. R.) was v. Hippel's. The first dose is 1/500 mg. of the dry substance. Every second day an injection is made and the dose is increased 1/500 mg. When 1/50 mg. is reached, the dose is increased each time 1/50 mg. When 1/5 mg. is reached, it is increased 1/10 mg. provided the temperature does not rise above 38° C. The dose is not increased beyond 1 mg. The highest dose is continued until the disease is healed. If, by a lower dose, there is fever, that dose is continued until fever ceases, or a lower dose is given. Individual susceptibility varies greatly and in many cases, it is said, the patients become more sensitive, so that the dose must be progressively lowered. The directions for the preparation of the solutions and dosage may be of use.

Three solutions are needed. Since in 1 c. c. of tuberculin as purchased, there is 10 mg. of the solid substance, one injects with 0.1 c. c. of a dilution of the first solution of 2 in 1000, 1/500 mg. of the solid extract. The first solution needed then is 2 in 1000. After 10 injections, increasing 0.1 ccm at each dose we reach 1 ccm and inject 1/50 mg.; for this a second solution of 2.0 in 100 is needed. With this one increases the dose again 0.1 ccm. For the third solution 1.0 in 10 is used and 0.2 of this contains 1/10 mg. of the solid tuberculin. Beginning with 0.2 ccm of this, one increases each dose 0.1 ccm until 1. ccm is reached, which equals 1 mg. of the solid. Higher dosage is not attempted.

For dilution, glycerine is used; the solution must be clear and should not be kept longer than 14 days.

A brief review of the literature dealing with the treatment of uveitis with tuberculin follows, and a statement of the author's very conservative position which may be put as follows:—Treat first the other conditions which may be present, rheumatism or syphilis, if there are any indications; if there is no improvement and the reaction to tuberculin is positive, thorough anti-tubercular treatment is justifiable. Then follows a summary of the results of the author's work, given in this hundred page Arbeit, and a discussion of the statistics of tuberculosis in different parts of Germany, as accounting for the somewhat diverse opinions held at different Universities. The bibliography contains 90 references.

C. W. C.

On The Double Focus Crystalline Lens.

FREYTAG, (*Muench, med. Wochenschrift*, Feb. 12, 1907.) On reflecting light through the pupillary space, this condition occasions the appearance of a dark red transparent disk 4—5 mm. in diameter which is more myopic than the peripheral equally clear lens substance. While many writers have associated this phenomenon with senile cataract, classifying it amongst the prodromal symptoms of the disease, Szily and Hess are inclined to consider it an independent affection. Freytag attempted to produce this condition experimentally, and incidentally to study its relations to cataract. He submerged various kinds of animal lenses of different ages in solutions, some of which would produce cataract, others which would not. The solutions employed were distilled water, normal salt solution, glacial acetic acid, 50% alcohol, 5% formalin, olive oil, xylol and glycerine. His conclusions based on these experiments were that both varieties were capable of microscopically differentiating a nucleus from the cortex, though he was unable to demonstrate two foci.

He therefore believes it possible that amongst the injurious substances affecting the lenses of elderly individuals there are such which can cause differentiation without disturbing the transparency of the lens, furnishing the clinical pictures of a lens "*in lente*". He does not deny of course the possibility of

this affection being combined with cataractous degenerations, but for those cases which have been reported in which the double focus lens remained clear, his deductions contribute a separate etiology and the conception of the disease as one "Sui generis" becomes more rational. A. C. S.

Fracture of the Cervical Vertebra and Argyll-Robertson Pupil.

BRASSERT, H., (*Muench. med. Woch.* Feb. 5, 1907.) Brassert publishes a case of old fracture of the second cervical vertebra in association with miosis and Argyll-Robertson pupil. The knee jerks were normal. He was unable to make a complete study of the case, and merely submits it as a further contribution to the view ascribing the Argyll-Robertson pupil to a probable lesion in the upper cervical cord (Dreyfus).

A. C. S.

On Enophthalmus.

PAGENSTECHE, (*Muench. med. Woch.* March 5, 1907.) The author describes two cases of traumatic enophthalmus. Both followed severe traumatism of the orbital rim. While as yet no theory has been advanced explaining satisfactorily such cases in general, in these two the enophthalmus was most likely brought about by fracture of the orbital margins and walls, penetration of the fragments into the orbit, contusion of the orbital tissue, and hemorrhage; the subsequent cicatrization then led to a retraction of the eyeball.

Sudden enophthalmus is probably due to destruction of the orbital floor permitting the orbital fat to fall through. Disturbances of motility may not always be attributed to nerve injury but to lesions of the muscles. Moreover restricted motility is sometimes occasioned by adhesions involving the antagonistic groups of muscles. The prognosis as to functional restitution and a return to normal position is most unfavorable.

He also mentions a case of sudden exophthalmus in a young girl which occurred while bending forward. Lid ecchymosis followed and enophthalmus gradually appeared. Several days after the onset of exophthalmus her first menses appeared. At the present time the eye resumes its former place (owing to distension of the orbital veins) when the patient stoops over, but

falls back into the orbit when she stands erect. He ascribes the condition to a retrobulbar hemorrhage and its sequellae.

He would rather class this case with those of intermittent exophthalmus, an exophthalmus which only appears during the stooping posture, or with those of intermittent ex- and enophthalmus.

A. C. S.

Clinical Studies Upon Relapsing Corneal Erosions.

KAUFFMAN, E., (*Die ophthalm. Klinik No. 3, 1907.*) Kauffmann divides the affection into three groups:

Group 1. Traumatic keratalgia. The epithelium apparently has been normally regenerated. Neuralgic pains however still persist on opening the eyes in the morning. The epithelium is loosely adherent and can be readily detached.

Group 2. There is an abnormal epithelial regeneration characterized by irregularity of surface and loose attachment. Intra- and subepithelial opacities occur and at times opacities are present in the deeper portions of the cornea. Epithelial degeneration as a rule extends beyond the limits of the original lesion. The first recurrence happens usually weeks or months after the first cicatrization. The attacks occur mostly in intervals of several months; during the intervening periods there may be no symptoms or merely keratalgic manifestations. The disease frequently runs a protracted course.

Group 3. The epithelium regenerates but is immediately thrown off. The corneal erosion therefore heals and the eye remains injected for months. Such a condition generally follows incompetent therapy (lead water applications and cocain).

The etiology of relapsing corneal erosions is unknown. The disease is particularly apt to occur after injuries inflicted by more or less sharp pointed instruments though occasionally it follows the mere deposition of particles of glass, metal, etc. on the corneal surface. Injuries involving only the epithelium especially predispose to recurrences. Septic complications may intervene, the condition then often resembling keratitis disciformis or ulcus rodens.

Treatment:—Prophylaxis is important. Fresh erosions should be treated by dionin, antiseptic ointments and bandage. It may be necessary to remove loose epithelium. Relapsing

erosions are best treated by removing the diseased epithelium and applying to the denuded surface a fresh solution of undiluted chlorine water. The treatment then follows the lines laid down for fresh erosions.

Only after repeated treatments have proven ineffectual is superficial galvanocauterization to be considered. The physician should always be cognizant of the possible sequelae of a superficial corneal lesion. The recognition of such possibilities often may be of importance from a medicolegal point of view. Patients with corneal erosions should be informed that permanent cure depends largely on conscientious persistence in the prescribed course of treatment'. A. C. S.

Purulent Dacryocystitis in the New Born.

OLLENDORFF, (*Div. ophthalm. Klinik No. 2, 1907.*) This affection is generally attributed to a congenital atresia of the lower end of the nasal canal. Ollendorff reports eight cases. In but two was the diagnosis made at the first examination, the initial symptoms comprising merely a catarrhal or purulent conjunctivitis, in several instances not unlike ophthalmia neonatorum. The initial conjunctivitis was:—

Unilateral in 1 case—Subsequent dacryocystitis on the same side.

Bilateral in 2 cases—but particularly pronounced on the side eventually developing dacryocystitis.

Bilateral in 1 case—subsequent bilateral dacryocystitis.

Bilateral in 1 case—subsequent unilateral dacryocystitis.

Dacryocystitis was diagnosed once on the 10th, 14th, 22nd, and 39th day, twice on the 28th day of observation. Nevertheless, he is of the opinion that the conjunctival manifestations were secondary to a latent dacryocystitis; in only one case did it seem that the conjunctivitis was the primary condition.

Diagnosis:—The diagnosis is based on the results of expression. It may be facilitated by slitting of the canaliculus. The child should be examined in the morning as early as possible. Attendants should be warned not to touch the affected region.

Treatment:—The treatment may be either the conservative, expectant (expression and massage) or consist in the early in-

troduction of a probe. In only two of the cases did the expectant treatment effect the cure, while a single probing quickly proved effectual in every case it was tried. The author is therefore convinced that this is the better treatment. The expectant treatment may however be given a brief trial.

He employs a Bowman's probe No. 2 after either dilating or slitting the canaliculus. No anesthetic is required. The probing is advantageously followed by the application of warm antiseptic compresses. The successful treatment of this affection is often followed by a marked general improvement.

The obstinate blennorrhoea caused by tuberculosis of the lacrimal sac demands extirpation of that structure. He concludes by saying that all cases of purulent or catarrhal conjunctivitis in the new born, not gonorrheal in origin should arouse a suspicion of latent lacrimal sac disease, especially if the conjunctivitis be one-sided.

A. C. S.

The Differential Diagnosis Between the Argyll-Robertson Pupil and Absolute Pupillary Inaction.

BACH, (*Muench. med. Wochenschrift*, Feb. 19, 1907). Bach considers the Argyll-Robertson pupil in at least 95% of cases to be indicative of tabes or tabo-paralysis; it is important therefore to differentiate it from absolute pupillary inaction which may occur in various conditions. When the latter does complicate dementia paralytica, tabo-paralysis or tabes, it suggests a previous or associated brain syphilis and, in diagnosing between dementia paralytica and brain syphilis, the occurrence of absolute pupillary inaction, especially if combined with accommodative paresis favors a diagnosis of cerebral syphilis. He is decidedly opposed to the theory which regards the absolute pupillary inaction of dementia paralytica as an advanced Argyll-Robertson pupil ("*totale reflectorische Starre*"). Generally in such cases there is no proof that an Argyll-Robertson pupil ever existed and even if it did the subsequent condition is no argument in favor of assigning both to similar etiological factors. Neither anatomical, experimental or clinical investigations support such an opinion.

A double-sided Argyll-Robertson pupil may be followed by a one-sided or double-sided paralysis of all external and inter-

nal ocular muscles which may regress, though the Argyll-Robertson pupil remains. The palsy of the external ocular muscles may recur, the pupillary conditions remaining unchanged. Conversely, to a one-sided or double-sided palsy of several or all external ocular muscles, an Argyll-Robertson pupil may associate itself. More statistics regarding such combinations are desired.

Discussing the probable localization of the lesion (supposing both Argyll-Robertson pupil and ocular palsies attributable to a lesion in the third nerve nucleus) in a case of one-sided paralysis of all external muscles supplied by the third nerve, in combination with double Argyll-Robertson pupil, he concludes that inasmuch as no sharp boundary lines separate the nuclei of the third nerve, it is hard to conceive why a primary nuclear disturbance should only single out certain nuclei.

The diagnosis is more difficult when the light reflex is lost while the paths for sensory and psychical impulses are only slightly affected, resulting in the dilated pupil of pupillary inaction. Preservation of convergence reaction, however, points to Argyll-Robertson pupil. Or it may be difficult in absolute pupillary inaction during regression. In one-sided disturbances, however, the affected pupil is usually wider, such also being the case during convergence which is rather sluggish.

Some cases are not diagnosed until the return of the light reflex and of normal convergence reaction. Very rarely an Argyll-Robertson pupil may result from absolute pupillary inaction but this indicates nothing concerning the nature, etiology or localization of Argyll-Robertson pupil in general.

In conclusion he cites a case of congenital or early acquired absolute pupillary inaction with miosis strongly resembling Argyll-Robertson pupil.

A. C. S.

**Studies upon the Presence of Bactericidal Substances in the
Conjunctival Secretion; also Remarks Concerning the
Healing Progress in Conjunctival Catarrh.**

NEDDEN, (*Zeitschrift f. Augenheilkunde*, October 1907. Vol. XVIII—4). Nedden finds that the normal secretion of the tears and the contents of the lacrimal sac have no bactericidal action. The secretions in catarrhal inflammation of the conjunctiva, on

the contrary, were decidedly bactericidal in action. The liquid portion of the secretion appeared to be more active than the cellular elements. The more acute the disease and the more profuse the secretion, the more active is the bactericidal action of the conjunctival secretion. The manner of infection, or its duration have no influence upon this result. The bactericidal action was lost by prolonged exposure to air or heating for 45 minutes at 58° C. Quick drying of the secretion had no effect on the bactericidal influence. Healing takes place, therefore, by opsonins secreted in the conjunctival sac from the blood. The mechanical removal and immediate death of bacteria by the application of astringents is of great benefit, but only to the extent that the activity of the tissues acts in the healing process. The astringents cause a hyperemia of the tissues which calls forth an increased amount of bactericidal secretion, and thereby bring about more rapid cure.

The healing of ulcers of the cornea is also less caused by direct action of disinfectants and astringents, than by the increased bactericidal inflammatory products. Zinc sulphate is well adapted to bring about such increased secretion. It has no specific action on diplobacilli.

The Pathologic-Anatomic Changes of the Blood Vessels of the Eye in Syphilis.

MICHEL, (*Zeitschrift f. Augenheilkunde*, Oct. 1907, Vol. XVIII, 4). Michel states that pathologic-anatomic examination of the syphilitic eye is uncommon. The case reported by him consisted of a widespread syphilitic affection of the bloodvessels of the eyeball, which was recognized only after microscopic examination of the enucleated eyeball.

A 38 year old man, with a normal right eye, suffered from highly increased tension of the left eye, with haze of cornea and vitreous preventing ophthalmoscopic examination. The eye was blind, and was enucleated on suspicion of intraocular tumor.

The patient gave no history of syphilis, nor were any other lesions demonstrable. In the limbus of the cornea and in the sclera there was a round cell infiltration around the bloodvessels which did not affect the vessel walls. At the point of junction of the conjunctiva and cornea, the epithelium was raised

ABSTRACTS, GERMAN OPHTHALM

greatly, and loosened. The posterior wall especially in the region of the pectinate ligament round cells.

The iris had a number of irregular round cells, each surrounding a blood vessel. The media were clear. The choroid was free of leucocytes, the vessel walls, remaining intact. The central artery of the retina, however, was filled with round cells, which in the periphery were distributed forming projections into the lumen.

The arteries and veins in the optic nerve were surrounded by a round cell infiltration, which extended into the lamina propria layer. The author believes that this is a characteristic of syphilitic disease of the eye. The round cell infiltration almost exclusively involved the intima of the blood vessels.

Studies of the Bacteria Infecting the Conjunctiva After Operation Upon for Cataract, and Treated With A

NAPP (*Zeitschrift f. Augenheilkunde*):—The author examined bacteriologically the eyes of 171 patients operated for cataract, before the operation and some time after. The patients were prepared by thorough disinfection of the regions about the eye, cutting of the cilia, and free washing of the conjunctival sac with sterile water. A conjunctival flap of 4 mm. was made.

Both eyes were bandaged for 24 hours. A sterile monocular bandage was applied for 48 hours, and changed every 12 hours. Mydriatic was used, and a 3% boric vaselin was applied. No bacteria were found previous to operation, but after operation, and the eye appropriately treated.

In 70 patients the bacterial examination was made previous to operation. Of these, 7 remained free of bacteria rapidly without irritation. In 17 patients conjunctivitis only developed, in 11 of which the irritation was severe. In several, conjunctivitis developed in 7—10 days. Two patients developed iritis in 7—10 days. *Staphylococcus aureus* only was found.

the patient developing a light grade of iritis on the 5th day. Streptococcus was found in one case, the healing being uneventful. In five cases, staphylococcus albus and aureus were found, the healing being uneventful as in another case, showing streptococci additionally.

In the remainder of the cases, in addition to the staphylococci, there were present xerosis bacilli, pneumococci, diplobacillus of Morax-Axenfeld, Bacillus mesentericus and Friedlander's Pneumobacillus (one case) The wound healed primarily in all these cases, though conjunctival catarrh developed generally.

In the remainder of the cases bacteria were present previous to operation, in spite of which they were operated upon if no conjunctival catarrh or irritation was present. Staphylococcus albus and xerosis bacilli were most frequently present. In every case there were increased catarrhal secretion after the operation but the wound healed normally.

In 15 cases, a severe conjunctival catarrh developed which yielded to treatment. In these cases, diplobacilli and streptococci were most often present. A severe inflammation of the uvea occurred in 10 cases, in which the author believes a possible saprophytic infection may have been implicated.

He concludes that (1) In most cases, though the conjunctival sac was apparently free of bacteria before operation, bacteria were present after the operation. (2) In patients, whose conjunctival sacs contained bacteria previous to operation, the bacteria were increased in number after operation.

(3) The presence of pathogenic and non-pathogenic bacteria had no influence on the healing of the wound. The author believes that this was due to rapid healing of the long conjunctival flap.

4. Nonpathogenic bacteria under certain circumstances can cause conjunctival catarrh, aided perhaps by the disposition of the patient or the mechanical irritation caused by the fixation forceps. This form of catarrh subsides rapidly.

The author believes that in spite of the increase in bacteria due to the bandage after operation for cataract, the bandage should not be abandoned, as the healing is affected thereby.

F. K.

ABSTRACTS, GERMAN OPHTHALM

Experimental Studies of the Tissue Change Novokain.

VERDERAME: (*Zeitschrift f. Augen*)
Verderame states that the great value of the local anesthetic is diminished by the local possibility of poisoning by its use. It is vaunted at various times as being innocuous by different authors, especially by Rehn, for less necrotic and inflammatory changes than cocaine.

Novokain, it has been stated, is free from

The author experimented with a 2 per cent. solution instilled into the conjunctival sac in human eyes. Subsequent irrigation of the anterior chamber also made.

He concludes that novokain is similar to cocaine in that it damages living tissue of the eye, it causes a dryness of the corneal elevations of the epithelial layer and finally produces extensive defects of the

The anesthetic value of novokain is diminished while its destructive action on the cornea is greater than cocaine. Novokain had no action on accommodation, thus making it of poor value in glaucoma.

Much swelling and injection of the conjunctiva on injection of novokain, as compared with cocaine on the cornea.—Extensive deleterious changes in the cornea in those rabbits in which the cornea was irrigated with a 5 per cent. solution of novokain. The author believes that cocaine is still superior to novokain as a local anesthetic. No symptoms of poisoning were discovered after the use of novokain.

New, Diagnostically Important Results Obtained by Transillumination Lamp

VUELLERS (*Zeitschrift f. Augenheilk.*)
demonstrates pictorially interesting results

iritis, secondary glaucoma, iridodialysis, secondary cataract, etc. He demonstrates that in iritis, the pupil is much larger in transillumination, due to the absorption of pigment, though the iris stroma remains. He believes, therefore, that Fuchs' assertion that in atrophy of the iris, the sphincter iridis and retinal pigment are longest retained, is incorrect. The direction of a steel foreign body was determined by a second area of pigment disturbance in the iris showing up as a red reflex. In a case of iridodialysis, the injury was shown to be much greater in the transillumination, thus explaining the patient's complaint of dim vision and hypersensitiveness to light. F. K.

Removal of a Lens Luxated During Extraction Seven Years Previously

KOSTER (*Zeitschrift f. Augenheilk.*, xviii, 3). Koster reports a case occurring in a 55 year old man whose both eyes were operated upon for removal of the lens for high myopia and zonular cataract seven years previously. After dissection of the left lens, the nucleus, during attempt at extraction, disappeared in the vitreous. The eye remained quiet with 6/60 vision for seven years, when the nucleus of the lens reappeared in the anterior chamber and caused intense iridocyclitis. The author removed the lens after which the inflammation subsided. The vision obtained was only 3.300, owing to corneal opacity resulting from a diffuse pressure keratitis.

The author thinks that reclinatioin could be done safely in suitable cases, where extraction cannot be performed, though it always should be borne in mind that the lens in the vitreous is a foreign body that, in after years, can cause a severe inflammation. F. K.

Removal of Foreign Bodies From the Orbit.

LIEBLIN, VIKTOR, (*Prager med. Wochenschrift*, 1906 No. 50 ref. in *Wochenschrift, f. Ther. und Hyg. des Auges*, Jan 3, 1907). Lieblin reports a case from the surgical clinic of Prof. A. Wölfler in Prague, in which a bullet lodged in the orbit, on the temporal side in front of the ciliary ganglion. There was marked limitation downward of the eyeball, showing a lesion of the inferior rectus, moderate protrusion of the eyeball, "hole" formation at the macula, and extensive hemorrhages into, and in front of, the retina from contusion. Vision equalled finger counting

ABSTRACTS, GERMAN OPHTHAL

at $2\frac{1}{2}$ m., and the visual field showed
ma., dependent upon the macular dis

As the X-ray examination localized
poral wall of the orbit, Lieblin decided
tion by means of the Krönlein operati
performed 11 days after the injury. A
flap the author found it necessary to s
muscle, as it prevented exact examin
space. The projectile was quickly fo
was removed after careful dissection.
reunite the cut edges of the external re
ward movement of the eyeball was lost.
to o. 2, and the absolute scotoma b
ments of the eye ball were good except

The first operation by this method
body in the orbit was done by Eichell
cessful operation was performed by Me
three others, two by von Bergmann in
bronn in 1905, the bullets were not fo
been localized by the Röntgen rays. In
his case concluded that the Krönlein
cated in the presence of foreign bodies
account of the difficulty in finding th
with Heilbronn, and thinks the ope
X-ray examination positively localizes
lateral part of the orbit.

A Contribution to the Treatment

BJERRUM, J. (*Centralbl. f. prakt. Au*
Bjerrum describes his method of oper
small, but strong knife, with a two-edge
duces 2 mm. behind the cornea and brin
the cornea under the conjunctiva bulbi.
der the conjunctiva, and after a couple o
knife is withdrawn. He reports very g
cision, and claims that a prolapse of the
and if it does, can easily be corrected.

Contribution to the Treatment of Embolism the Retina.

J. FEJER, (*Centralbl. f. prakt. Auge*

Fejer reports a second case, where a complete restoration of sight followed massage of the eye for embolus of the arteria centralis retinae. C. L.

A Splinter of Steel Healed in the Iris and Borne without Irritation for 10 Years.

BERGMEISTER, OTTO, VIENNA (*Centralblatt f. prakt. Augenheilkunde*, xxxi, p. 257, Sept. 1907). Bergmeister reviews two cases reported by Bock in the March issue of the *Centralblatt*, of foreign bodies which lay on the surface of the iris for several years without causing any untoward symptoms. Bergmeister's own case was that of an officer who complained that for a short time previously, his right eye would at intervals become inflamed. Examination showed circumcorneal injection, especially in the upper inner quadrant. In the corresponding area of the iris was a black foreign body. Upon questioning, the patient admitted that 10 years previously, in a duel, a piece of a saber had broken off and struck his eye. After a temporary irritation, however, the eye had recovered and remained normal to the present time, without any siderosis. The portion of the iris containing the foreign body was excised, but unfortunately the body was lost in the hemorrhage into the interior chamber, and could not be found even after this had disappeared. About five months later the patient returned and the foreign body could be seen on the lower arm of the iris coloboma. This was shown to be iron by means of the electro-magnet. The second operation was successful. The foreign body weighed 0.0008 g. and consisted of two pieces of iron imbedded in tissue. The iron itself weighed only 0.0004 g.

The reason that the body had never been discovered was probably that it lay in some fold of the iris, and later shifted its position. C. L.

A Case of Detachment of the Retinae Cured by a Blow on the Head.

REMAK (*Centralblatt f. prakt. Augenheilkunde*, xxxi, p. 262, Sept. 1907). Remak reports a very interesting case whose parallel he has been unable to find in the literature. Mrs. G complained of a shadow and flashes of light in her right eye, and examination showed a detachment of the retina, not, however, involving the macula. V—5·10. Vitreous opacities. Rest in bed

ABSTRACTS, GERMAN OPHTHAL

with sweating and iodides apparently but as soon as the patient left the bed, in an aggravated form. $V=1/5$. One June 1907, the patient presented herself the eye showed no signs of the previous said that in Jan. 1906, while taking a the right side of the forehead by a blow knocked her down and caused hemorrhage occiput. Immediately after the accident white flashes of light in both eyes, within three days. Thereupon there was a vision in the right eye, reaching normal months.

The author believes that the blow occasioned rupture of the retina and flow of the vitreous, which pressed the retina back and allowed it to become reattached.

Embolus Arteriae Centralis Retinae 1

CASPER L., Mulheim, (*Centralbl. f. xxxi*, p. 289, Oct. 1907). Casper reports Mrs. G. complained of sudden loss of vision examination showed obliteration of the narrowing of the veins, pale disk, rigidity, the eye was thrice massaged, 1 Next morning there was a small amount Under massage twice daily, all except the began to resume their circulation, and retina supported by them began to function beginning of the condition 0.002 strychnine into the temporal region every other day superior very slowly recovered its circulation month later was smaller than normal, etc. The corresponding scotoma had become red and green could not be distinguished the appearance of the embolism $V=3.5$ traction of the field for white remained pronounced downward and outward.

SOCIETY PROCEEDINGS.

SECTION ON OPHTHALMOLOGY.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Meeting October 15, 1907. Dr. Howard F. Hansell, Chairman, presiding.

Dr. C. A. Veasey reported a *Case of Unilateral Mixed Nystagmus which was Benefited by Treatment*. The patient was a twelve-year-old girl who had a convergent concomitant squint of 15 degrees, first observed at four years of age. The child was exceedingly nervous, and for two years had complained of involuntary movements of the right (squinting) eye. She had never observed diplopia, nor could it be demonstrated, and there had never been any similar movements in the left eye. The ocular excursions were good and she could converge to within three and one-half inches from the root of the nose. The pupillary reactions, media, fundi, and fields, were normal.

With her eyes in the primary position fixing a distant object, the nystagmus was at times mixed (vertical and rotary), at other times vertical only, and again purely rotary. The rotary movements were from right to left, that is, contrary to the movements of the hands of a clock. The nystagmus was not always present, but was always produced by any means that would make the child in the least degree nervous. With the eyes rotated upward or downward the movements were always rotary. When the eyes were directed to the extreme right, the movements were mixed (vertical and rotary); to the extreme left, the movements were vertical only. If the head were tilted toward the right or toward the left shoulder the movements were mixed. In forced convergence the movements did not differ in character from those observed when the eyes were in position of rest, but the oscillations were more rapid and more prolonged. The nystagmic excursions were very short and rapid, and were not altered by covering either eye.

SOCIETY PROCEED

The refractive error, a compound h
high degree, was corrected under at
worn constantly, and stereoscopic ex
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the nystagmic movements ceased unc
being observed only when something
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always an immediate slight outward
in order to fix the object, and just as
plished the nystagmus always ceased,
the child was, and under these conditio

On the Visible Remains of the Vitreous Cana
Dr. Burton Chance. (Published

Discussion.—Dr. Zentmayer called
quency with which opacities are met w
sule of the lens. He had found them
all patients examined. In 1 per cer
They occur as dense opacities varying
rape seed. They are often peduncula
do not interfere with vision and do n
Their situation is usually to the nasal
lens. He has always considered them
loid artery, and has been pleased to lea
has found them in 1 per cent., holds t

Dr. Zentmayer also recalled a cas
artery which was seen in an infant.
middle two-thirds of the posterior cap
the whereabouts of the other end of the
Some years later the patient was again
was found opaque. Ten years subsec
had become absorbed, the distal end h
proximal end was seen to be attached
tion of the canal doubtless had to do
the lens and the subsequent absorptio

Superficial Punctate Ke

Dr. William Zentmayer exhibited A
punctate Keratitis (Fuchs). The descriptio
seen three weeks previously was as foll

corneal congestion. Over almost the entire cornea there were punctate opacities varying in size from 0.5 to 2 mm. They were subepithelial. Some were separate, while others, especially the smaller ones, situated in the lower part of the cornea, were arranged in chains like cocci. They were green gray in color, and the intermediate corneal tissue showed fine linear haze. The overlying epithelium was elevated. The pupil dilated well. The irritation symptoms were allayed in a few days by the use of a 1 per cent. solution of holocaine. At present the eye is quiet and some of the smaller dots have disappeared, but almost the entire cornea is still covered with the larger dots. The patient is a male, aged twenty-four years, in good health but not well nourished. There was no history of trauma. There has been no catarrh of the ocular or respiratory mucous membrane.

The Significance of Unilateral Mydriasis.

Dr. Howard F. Hansell mentioned the two well-known varieties, and suggested that a third be added to make the classification complete: (1) the spastic; (2) the paralytic; (3) the functional. In the first, we have to do with irritation of the sympathetic; in the second, with paralysis of the iris branch of the motor oculi; and the third is a reflex sign of some morbid condition of one of the organs of the body. The three varieties are exclusive of pupillary abnormalities dependent upon ocular disease. Pupillary inequality may be a symptom of many diseases, or it may be present in persons who are supposed to be entirely healthy. As a rule, the paralytic variety should be regarded as an early sign of serious disease of the cerebro-spinal system. He interpolated his remarks with the report of three cases, each of which was illustrative of one variety of the affection.

A Case of Vernal Conjunctivitis Showing Unusual Corneal Conditions.

Dr. Wm. Campbell Posey showed a young colored woman, the subject of vernal conjunctivitis, in whom both corneae were covered by a diffuse haze, which seemed to be made up of thickened epithelial and subepithelial elements. (Published in full p. 600).

Discussion.—Dr. Hansell spoke of the uncertainty of the re-

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sults obtained from any form of treatment which had been submitted faithfully to by an expert, without success. The cornea had progressed, and the cornea had become opaque, which had remained, and although supplied much with vision. He thought the cornea had been due to the X-ray treatment. The use of a lotion of bichloride of mercury had gradually improved.

Dr. Sweet referred to a case which he had treated with X-rays at the request of Dr. Zentgraf. The cornea was still under observation. One lid had been removed, on the other, an elevated spot remained, and in size, and for two summers there had been no return of the inflammatory symptoms. He thought that a trial of treatment should be given a trial in order to be believed that the results would prove satisfactory.

In closing the discussion, Dr. Posey referred to lesions in the case which he had reported as being due to the ulceration of the cornea which occurred in cases of vernal conjunctivitis, where there are excoriations on the conjunctiva which excite the inflammation by pressure. He referred to the distribution of vernal conjunctivitis over all parts of the United States, occurring apparently with equal frequency in all localities. He said he had seen a boy on the high mountains of Peru who suffered from the disease. Others in the same village were equally affected. Dr. Posey believed that the disease had a tendency to wear itself out, as it were, after five years, and advised a continuance of astringent medication during the winter months.

Meeting November 19, 1907. Dr. Zentgraf, Chairman, presiding.

Argyrosis due to Argyrol

Dr. Frederick Krauss reported a *Case of Argyrosis due to the Use of Argyrol*, and exhibited the p

four years, who had been under treatment for dacryocystitis. Without the knowledge of the attending physician, the parents had instilled one drop of a 20 per cent. solution of argyrol into the conjunctival cul-de-sac of the right eye for a period of twenty months. The coloration was deepest in the lower fornix and on the caruncle, and diminished rapidly upon the withdrawal of the drug and the administration of potassium iodide.

Dr. Pyle said that in reply to an inquiry the manufacturers of argyrol stated that the argyrosis was rare and of short duration, and would usually disappear completely by the use internally and locally of sodium iodide. In cases which follow the injection of solutions of argyrol into the cellular tissues after false passages of lacrimal probes, weak solutions of sodium iodide should be injected through the canaliculus.

Dr. Hansell said the manufacturers insisted that the drug should be freshly prepared, and he thought, as it was so extensively used at present, many other cases would be seen, unless these directions were carried out. Dr. Ziegler said it was claimed by the manufacturers that solutions more than two weeks old, should not be used, and that the rare cases in which bad results were obtained were due to the use of old solutions. He had seen one case which showed slight staining from prolonged use of the drug.

Keratitis Profunda.

Dr. Krauss exhibited also a *Case of Keratitis Profunda* occurring in a girl, aged seven years, who had no history of syphilis, rheumatism, malaria, or traumatism. Vaccination had been performed four weeks previously without producing any untoward symptoms. The case was particularly interesting because, aside from its rarity, Fuchs states that the disease occurs only in adults. The opacity in the left eye was disciform and situated in the deeper layers of the cornea, with numerous spots of denser opacity, most marked in its periphery. In the right eye it consisted of four distinct areas, arranged in a crescentic form across the cornea. When viewed with high power, these areas were found to consist of a fine stippling placed just in front of Descemet's membrane. The course of the disease was chronic, inflammatory symptoms and new vessel formation being absent.

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The Ocular Symptoms of Chroni

Dr. G. E. de Schweinitz described ophthalmoscopic appearances of a patient with polycythemia and splenomegaly under the care of Dr. Sweet in the medical wards of the University of Michigan. The patient had begun seven years ago with hemoptysis. The patient was markedly cyanotic, especially in the fingers. The red blood cells varied from 11,000 to 7,500,000, the lowest count, and the hemoglobin from 100+ to 140. The patient had normal pupillary movements, and external ocular muscles normal in all respects. The entire fundus was slightly redder than normal. The arteries were slightly narrower than normal, and the veins were being two or three times their normal diameter, and being uneven and markedly tortuous. The tortuous course presented a striking picture. Retinal hemorrhages and exudates were present.

The retinal veins in Dr. de Schweinitz's case were in appearance to those which have been described by and Jackson, and the fundus differed from that of the patient in the absence of retinal hemorrhages and exudates in the disk which the distended retinal vessels. Dr. de Schweinitz contrasted the ophthalmoscopic picture of chronic cyanotic polycythemia and that of the patient, pointing out the differences between the two.

Double Perforation of the Eyeball by a

Dr. E. A. Shumway read a paper upon a case of injury to the eye by a foreign body. (*Published in full Page 579.*)

Discussion.—Dr. Sweet showed a specimen of a cornea which had enucleated which contained a foreign body passing from the sclera posteriorly. The cornea was in the paper presented at the meeting of the Ophthalmological Society in 1907, in which he reported 22 cases of double perforation.

Dr. de Schweinitz referred briefly to a case of a foreign body 12 mm. long, had been localized

two attempts at removal by the route through the space of Tenon had been unsuccessful. No wound of entrance could be found, but ophthalmoscopic examination showed a mass of exudate and detachment of the retina in the upper outer part of the eyeground, anteriorly. The iris was becoming discolored, in a way often characteristic of siderosis, and the body might be partly within the eyeball. No response had been obtained by the magnet at the time of operation, nor could the body be felt by a strabismus hook, although it was introduced into the orbit evidently through a rent in the capsule posteriorly.

Dr. Ziegler had seen a number of cases of double perforation in recent years. In one, a piece of a dynamite cartridge had been removed from the eyeball, and a second piece was localized in the orbit back of the eye. This was allowed to remain, and had caused no trouble. He had had the same experience with other foreign bodies lodging in the orbit, and thought they should not be interfered with. In one case the foreign body was localized in the sclera, and unsuccessful attempts were made to secure it both through the eyeball and through the space of Tenon. The eyeball was afterward enucleated by Dr. de Schweinitz, and the steel was found within the eye. He thought the manipulation of the magnet might have dislodged it from the sclera.

Dr. Sweet referred to the difficulties of localization made possible by variations in the size of the eyeball, and to possible errors in calculation. In the case mentioned by Dr. Ziegler the steel was localized as protruding partially through the posterior scleral wall, and he thought it might have been drawn entirely within the globe by the strong magnetic pull. Dr. de Schweinitz said that careful serial sections of the eyeball by Dr. Hosmer proved that the sclera had not been perforated posteriorly.

Observations on the Motais Operation for Ptosis. Report of Three Cases., Dr. Wm. T. Shoemaker. (Published in full page 608)

Discussion.—Dr. Posey said that he had never done the Motais operation, as he thought the traction which the lid would exert upon the globe would be undesirable. He called attention to the asthenopia which symblepharon and even swollen lids may occasion by pressure on the eye and by limitation of its move-

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ments. In any event, the Motais operation is applicable to many cases of congenital ptosis. The superior rectus muscle is often atrophied as well as the levator. He had usually performed the operation himself, but recently had employed the modification, as he had found that the levator did not always exert sufficient effect. He had performed a marked congenital ptosis, upon whom the operation had been done six weeks previously. The position and there was but little disturbance.

Dr. de Schweinitz said that he had performed the Motais operation for the relief of ptosis. He could add nothing to the discussion for he had not. He congratulated Dr. Shoemaker on the fact that he had explained the steps of the operation which he had suggested. Dr. de Schweinitz said that his operations had confined himself to various operations, Panas' operation, and the operation, and with the last named operation he had obtained satisfactory results in practically all cases. He had observed in the early days after the operation, that there might be a failure in the correlation of the upward and the downward rotation of the eye. This might occur in exophthalmic goitre. He said that this was a comparatively temporary failure, and must be regarded. Photographs were shown of the results of the Hunt-Tansley operation, of a patient with ptosis and complete atrophy of the rectus muscle of congenital origin, repaired and presumed, suited to the modification of the operation which Dr. Shoemaker had suggested, not dependent upon an imperfect development of the rectus, but upon imperfect innervation. He hoped to hear further from Dr. Shoemaker.

Dr. Sweet showed a patient on whom he had performed the Tansley operation on both eyes. The patient was resting in having complete external oblation of the eyes. He referred also to 2 cases of myopia which he had secured good results by the same operation.

Dr. Shoemaker, in closing, said that the Motais operation had not been popular in this country, and not many cases had been reported. There might be some dragging pain from the attachment of the eyelid to the eyeball, but in the few cases recorded he had found no such complaint. He thought that Dr. de Schweinitz's patient might be an excellent one to try the operation upon.

Rhythmical Movements of eyelids.

Dr. C. A. Veasey reported a case of *Rhythmical Alterations in the Width of the Palpebral Fissure of both Eyes Probably Produced by Spasm of the Levator Palpebrae Muscles* occurring in a boy, aged seven and one-half years, both of whose parents were more or less nervous. The child himself had always been nervous and quick in his movements. For several months there had been observed an upward movement of both upper lids, occurring about twenty times in a minute and sufficiently great in extent to uncover the cornea and expose the sclera above. The movements were much more marked at times than at others, but were especially bad when something occurred to make the child nervous. The movements were rhythmical in character, and were believed to be due to contraction of the levator muscles. The frontalis was not involved, nor were there any changes in the pupils. The patient had a moderate hyperopic astigmatism, which was corrected under atropine, and the glasses ordered to be worn constantly. This gave considerable relief, but the movements did not entirely cease until the patient was placed upon ascending doses of Fowler's solution of arsenic.

Dr. Pyle said he had seen similar rhythmical movements of the eyelids in a brother and sister, and correction of the compound hyperopic astigmatism had stopped the movements. In these cases the movements were evidently due to eyestrain as no internal medication had been found necessary.

Simple Glaucoma in the Young.

Dr. C. A. Vearey also made a *Supplemental Report of a Case of Simple Glaucoma in the Young*. In conjunction with Dr. Shumway he had reported the case before the section in

December, 1903. The patient was who at sixteen years of age began to in the right eye, after an attack of t had there been pain, but the eye be spite treatment during the course severe attacks of pain became so was performed. Microscopical exam excavation of the optic nerve, an i pigmentation in the tissues about chamber.

Six months ago, three and one-half case and seventeen years from the a the first eye, the patient presented b vision in the remaining eye, when c tion showed a beginning glaucomat crowded to one side and the visual field The tension was slightly elevated. employed locally and strychnine an but in spite of this the cup of the opt more extensive and the field of vision When it was found, after some we gradually increasing strengths did i the glaucoma, iridectomy was pro months had now elapsed, the patien operative procedure whenever such w the myotic treatment, together wit had been carefully and faithfully e now almost totally blind, there rema of eccentric vision and the field being area. Dr. Pyle said he had seen a c a child fifteen years of age at one of

Dr. Posey said that he thought it i case had some underlying cause, such believe an ordinary case of chronic si so much field and visual acuity in si fore, one could draw no deductions f of the myotic treatment of chronic g that juvenile glaucoma must be a rar of 164 cases of chronic glaucoma co

and himself some years ago, but one case occurred in a subject under twenty-five years of age.

Dr. Turner said he thought Dr. Veasey's patient had complained of failing vision in the second eye for eighteen months before she became blind. Dr. Veasey replied that she had complained of metamorphopsia and photopsia ever since he had known her, and he had studied the case for a long time with the idea of ascertaining whether there was any connection between these conditions and the appearance of glaucoma simplex, but there was no sign of cupping of the nerve and impaired vision until the examination six months before writing the notes, when the patient said she had first noticed failing vision three months before. No examination had been made for some months previous, and vision may have been failing for some months before she observed it. He had not gone into the literature of the subject at this time, but the comparative rarity of the cases was shown in his previous paper, when less than three dozen reports of cases were found in the literature.

A Comparison between Simulated and Hysterical Blindness.

Dr. Howard F. Hansell briefly described the usual text-book symptoms of hysteria and the common tests for simulation, and called attention to the dissimilarity of the two affections. Cases arise, however, in which difficulty in the diagnosis is encountered, and a decision must be made and supported by the strongest evidence, in order to prevent injustice and lead to a proper line of treatment. Such a case was the following: A man received a superficial corneal wound from a fine fragment of glass while riding in a car. The corneal wound had entirely recovered, with the restoration of the transparency and curvature of the cornea in two or three weeks. At this time he claimed to be blind in the injured eye. The pupil reacted to light and convergence. The media were clear and the fundus was healthy. Binocular vision was demonstrated by deviation of the right eye, the one said to be blind, in overcoming prisms (Jackson's test) and in reading uninterruptedly when a pencil was held in front of the eye (Weiland's test). Subsequently the man suffered from dysentery, rectal fistula, and appendicitis, said by the medical experts

for the plaintiff to have been caused by infection of the corneal wound, notwithstanding the admission that the eye had perfectly recovered in three weeks without corneal scar. Dr. Hansell questioned (1) whether the eye could have been infected; (2) whether the other structures of the eye would not have shown some signs of involvement had the cornea been infected; (3) could the bloody diarrhea, rectal fistula, and appendicitis be the result of the accident to the eye; and (4) was the blindness hysterical or simulated. Two groups of medical experts testified in court under oath, the one that the long train of disasters was traceable to infection following the accident, the other that it was not. In view of this conflict of opinions, the thought is suggested that medical expert testimony might better be eliminated in suits for damages for personal injuries. In the usual jury trials scientific knowledge seems to carry little weight, the verdict depending rather upon the relative cleverness of the opposing attorneys in making their appeals to a sympathetic jury and emphasizing with pathetic tenderness the contrast between the "poor man" and the rich corporation."

Dr. Sweet said he had examined the case referred to by Dr. Hansell, but was not a witness at the trial. The tests had shown that the man was able to read with the eye which he claimed was blind, but he did not believe that this fact proved the case to be one of simulation. He considered the condition traumatic neurosis, and the man evidently believed he could not see. There was complete hemianesthesia, and, while he did not think infection had been the actual cause of blindness, he thought the man was not a malingerer.

Dr. Posey spoke of the difficulty there is in giving impartial testimony in cases of so-called "traumatic neuroses," and cited the instance of a man and wife who had been severely injured in a railroad accident a year previously. The head and eyes had not been involved in the accident, but ever since, reading or any prolonged use of the eyes had been attended with great pain. Both patients had high refraction errors, but corrected vision was normal and there was a good range of accommodation in both eyes, and the fields were unaffected. The ophthalmoscopic examination was negative. With these negative findings, one might impute the symptoms to malingering, yet

this might be most unjust to the patients, who might be actually suffering from neurasthenic asthenopia as a consequence of shock.

Dr. de Schweinitz thought that patients with hysterical blindness might be divided into three classes: Those who simulate the blindness, those who see unconsciously but are not capable of conscious vision, and those who really are transiently blind. It must be remembered that because hysterics apparently blind in one eye, that is, unconscious of its visual acts, may be proved to see with this eye by tests for the detection of malingerers, they are not necessarily malingering. As Pitres puts it, the uniformity of the answers given by the subjects of unilateral hysterical blindness is not reconcilable with the theory of deception in the ordinary acceptation of this term. The blind hysteric is consistent; the patient who pretends to be blind, but is not hysterical, is not consistent. In a sentence, the patient with unilateral hysterical amaurosis who is proved by ordinary tests to see with the supposedly blind eye is not thereby convicted of malingering.

Those hysterics who simulate the blindness are not malingerers in the ordinary sense of the term, but their simulation is part of the symptom-complex of their hysteria. They differ from those who, without other hysterical manifestations, deliberately simulate blindness, themselves being sound, for the purpose of gain, or to escape the duties of army service, etc.

Referring to that portion of Dr. Hansell's paper which had to do with the inconsistencies of expert medical testimony at the present time, he entirely agreed with him that such testimony would better be eliminated from the consideration of traumatic cases, unless suitable laws were enacted which should properly regulate not only the method of employing experts, but, just as well, the method by which these experts are frequently handled, or, more properly, mishandled, by the attorneys who are trying the case. Of one thing he was convinced, namely, that the subjects of traumatic neurosis, or traumatic hysteria, whatever the particular manifestation might be, were entitled to the fullest consideration, both from the legal and from the medical standpoint, as careful examination would frequently show that, in spite of their exaggerations, they were

none the less within proper limits (and it was exactly these limits that ought to be determined by suitable medical examination), as ill as if their symptoms represented the interpretations of a demonstrable organic lesion.

Dr. Pyle thought Dr. Posey and Dr. de Schweinitz had done well to call attention to the possibility of injustice to the plaintiffs in these cases. It must be borne in mind that although often their statements were plainly exaggerations, they were not malingerers, but the victims of profound neurasthenia or hysteria. In regard to the question of medical expert testimony, he believed that the best results would follow the appointment, by the court, of an impartial board of medical experts or referees, whose duties would include the elucidation of all doubtful technical questions referred by the judge, jury, or attorneys.

Ocular Manifestations of Tertiary Syphilis.

Drs. Wm. Campbell Posey and Frederick Krauss showed three colored women, all of whom presented ocular manifestations of tertiary syphilis.

CASE I, aged forty-two years, exhibited a very marked degree of syphilitic disease of the retinal vessels, with optic atrophy. Vision was much reduced in each eye. The arteries were reduced to mere threads and were covered in places with a grayish white opacity, which gave them the appearance of silver wires. The veins also showed signs of vasculitis. There were remnants of hemorrhages in the macular region. The authors referred to a degree of similarity with a case of perivasculitis recently reported by de Schweinitz, though the nasopharynx in the case under discussion was free from disease.

CASE II was one of cerebrospinal syphilis, with complete palsy of left oculomotor and trochlearis nerves, in whom the ocular symptoms rapidly disappeared under antisymphilitic treatment.

CASE III.—There was complete palsy of the third nerve in this case, the chief interest centering in the sudden and complete disappearance of head pain which had been present for months, with the onset of the palsy, the transference of the symptoms from the occiput to the eye being in apparent connection.

The authors said that isolated palsy of the eye muscles is not

infrequently the first symptom of syphilis. Probably at least half of the cases of ocular paralysis are due directly to syphilis and occur in the latter stages of the disease. Knies' figures were quoted, which indicate that the motor oculi are affected in about three-fourths of the cases, the abducens in one-fourth, the trochlearis and facial in 1 or 2 per cent. Syphilitic palsy is not so apt to be transitory or limited to single muscles as tabic paralysis.

The authors quoted Naunyn's figures, who had observed 70 per cent. of recoveries, and stated that his observation that there is no hope of recovery if evidences of improvement do not appear after vigorous treatment for two weeks, indicates the correctness of Callan's assumption that we too often needlessly postpone operative interference in such cases.

Operation for Ectropion.

Dr. Posey showed also a case of ectropion of the upper lid, which had been corrected by a Wharton-Jones sliding flap operation, in conjunction with an external canthoplasty. Healing had been uncomplicated, notwithstanding the necrotic condition of the tissues operated upon, the deformity having been occasioned by a dynamite explosion and the entire face badly scarred. Dr. Posey praised the Wharton-Jones procedure, dwelling particularly upon the excellent nourishment of the flap.

EDWARD A. SHUMWAY, *Clerk of Section.*

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of October 14, 1907. Dr. F. C. Hotz, Presiding.

A Case of Septicopyemic Metastasis in two Eyes of the Same Patient

Dr. Geo. F. Suker reported the case of a young woman who developed septicemia following an induced abortion. Both eyes became infected necessitating their removal. The left eye was first affected. The conjunctiva was very much swollen and the anterior chamber was filled with pus. There was complete loss of vision. Vision in the right eye was impaired, but the patient could count fingers at any distance. The left eye was eviscerated and the scleral cavity was packed with gauze, with the expectation of later implanting a glass sphere or of enucleating the stump and doing an Adams-Frost operation.

The media in the right eye were clear; the nerve head was somewhat edematous; cornea clear, but on the evening of the same day the vitreous and anterior chambers were filled with pus and the woman was completely blind. Under local hot applications and saline injections the eye quieted down, leaving an inferior staphyloma of the chorioid and sclera which finally subsided. The eyeball was quiet; the cornea cleared, and the anterior chamber became free from pus. The lens was cataractous. The iris was bound down by adhesions. A secondary irido-cyclitis set in and phthisis bulbi ensued. The eye had to be enucleated. A bacteriologic examination proved this to be a streptococcus infection. The bacteria were obtained from every section of the eye. The woman is alive and well.

A decalcified bone sphere was implanted in the capsule of the second eye removed first, and the cosmetic result is an excellent one. This is the fourth or fifth case where a patient survived a septicopyemia and the only case where a double enucleation was performed, the patient still being alive and well.

Discussion on Dr. Suker's case. Dr. F. Hotz has seen two cases of such infection following puerperal fever. In both

cases the patient recovered. The eyes were affected and sup-puration of the globes occurred destroying the eyes.

Dr. Brown Pusey asked whether the retinae were involved.

Dr. Suker replied that both the retina and chorioid were involved. The patient was in the hospital for about eight weeks and her temperature curve was characteristic of septicemia. At times the patient became maniacal. She developed one abscess after another, which had to be opened, the last abscess being a lacteal abscess. From the pus a pure culture of a very virulent streptococcus was obtained,—long chains of a large coccus.

Dr. A. T. Horn stated that the patient was 27 years old an II-para, with one miscarriage. She had had amenorrhea for two months, and about ten days before she was seen by Dr. Horn she had a gush of blood and after that a sanguinous discharge. Her pulse was 120; temperature, 104 degrees. There was much tenderness in the region of the uterus and tubes. On the evening of the same day the pulse was 138; temperature, 105 degrees. Under anesthesia the uterus was dilated and curetted of clots and shreds of membranes. An intra-uterine douche of permanganate was used, and the uterine cavity packed with gauze. The temperature dropped to 103.5 degrees, pulse, 130. The following morning the pulse was 102; temperature, 99 degrees. Attempt at abortion was denied and no fetus was found. The substances removed from the uterus proved to be secundines.

A Case of Albuminuric Retinitis in a Young Patient.

Dr. Mortimer Frank reported the case of a girl, aged 18 years, who was first seen by her family physician in July 1906 when she had dropsy of the feet and face. In September of this year there was still 5 per cent. of albumin in the urine. The disease was progressive, and a diagnosis was made of chronic Bright's disease. In October 1906, the patient complained of her vision, but no examination was made of the eyes. At that time the patient weighed 165 pounds from the dropsical accumulation. On the last Sunday in December 1906, she had a uremic convulsion, and there was complete anuria. She remained unconscious for 48 hours, then rallied and improved slowly.

In January 1907 she could only count fingers at one foot. In June 1907 when Dr. Frank first saw the patient the vision in the right eye was 6/12 plus; in the left eye hand movements. Under homatropin-cocain, right eye was 6/9 plus; with correction, plus 0.75 plus 1.00 ax 90; 6/6 in the left eye there was no improvement. The fundus was typical of an albuminuric retinitis. Vision gradually improved, and in August 1907, with glasses, she read 6/6—1, and in September, 1907, 6/6 plus, and on October 8, 1907 when last seen, vision equalled 6/5. No improvement in left eye.

Report of a Case of Double Conical Cornea.

Dr. F. Hotz had a young girl under observation for several years for conical corneae. In April, 1905, she was 13 years old, a slim, delicate, poorly developed girl. Her parents had noticed for several years that her sight was imperfect. Examination showed in the right eye a slight conical cornea, with nothing abnormal in the fundus. Vision was 20/400; no improvement with a combination of glasses. The left eye could only perceive the movements of the hand. The cone of the cornea was marked. Under atropin, on April 22, a minus 2 with minus 3 cylinder, axis 180, give vision to right eye of 20/70. Atropin was continued for a month, and examination on May 27, 1905, showed right eye minus 1 with minus 1 cylinder, axis 180. vision 20/50. Left eye gave 6/50 minus 2. In July the same result was obtained. In January 1906 the vision in the right eye was 20/70 without glasses, and with a plus 3 cylinder, axis 180, 20/40. In March, 1907 with plus 5 cylinder, axis 180, vision was 20/30, and in October the condition was the same, plus 5 cylinder gave 20/40 vision. The left eye still shows a conical cornea, but in the center of the right eye there is a little speck, but no cone of the cornea. The remarkable feature is that the myopia in the vertical meridian has changed to such a marked hyperopia.

Meeting of November 11, 1907. Dr. F. C. Hotz in the chair.

Tumor of Pituitary Body.

Dr. Casey A. Wood reported a case of probable tumor of the pituitary body exhibiting binasal hemianopsia, occurring in a

woman. The visual fields were characteristic, and the skiagraph which was taken of the skull showed an enlargement of the sella turcica and considerable increase in size of the pituitary body. One of the interesting clinical features of the case was the absence of menstruation.

Discussion.—Dr. Henry Gradle has seen six or eight cases of bitemporal hemianopsia in the past eight years. One of the patients was a woman, and she did not menstruate for at least one year. On looking up the literature on the subject, Dr. Gradle found mention made in a number of instances of probable or suspected tumor of the hypophysis, and of interference with menstruation in comparatively young women. Five of his patients presented striking appearance of the skull, and one patient had the so-called leonine face. Dr. Patrick examined this patient and found a general condition of infantilism, especially about the genitalia. The man was about 26 years old. Mentally he was unusually well developed. He was under observation for about a year and a half, and during that time the visual atrophy and deterioration of sight did not increase, so that, undoubtedly, the condition was relatively stationary for a while. This was not a clear-cut case of hemianopsia. In another case the condition was stationary for a year at least, if not three years. This patient presented the symptoms found in cases of fibroid tumors of the epipharynx, the so-called frog face. Another patient died, presumably from the effects of the tumor, but a postmortem was not made. The case began at the extreme temporal periphery in both eyes, and gradually became a bitemporal hemianopsia: remained stationary for a few months, and then increased to complete atrophy. It evidently was a case of intracranial tumor, but a postmortem was not made.

Dr. W. H. Peck has seen four cases of tumor of the pituitary body. In one case there was an enlargement of the sella turcica, and the woman later developed a terrific headache, to relieve which an operation was done. A portion of the right parietal bone was removed and that gave the patient considerable relief, but she died subsequently. In this case there was found a gangrene of about twelve inches of the intestine, and Dr. Oscar King, who saw the patient in consultation, thought

that this was a very rare complication, something he had never heard of before. Another woman who had a bitemporal hemianopsia lived about three years. In a third instance the condition followed an ovariectomy, and menstruation did not take place again after the operation. About a year later the tumor of the pituitary body developed, and the woman died after several months. Dr. Peck now has under observation a case that presents many of the symptoms cited by Dr. Wood, except that instead of being binasal it is bitemporal. The lady has enjoyed very good health, until about a year ago when she had very severe headaches, and since then there has been very little change in the bitemporal hemianopsia, but the patient has been actively engaged in business all of the time, which Dr. Peck thought worthy of mention.

Dr. E. F. Snyder saw a case with Dr. Sidney Kuh which presented a symptom not uncommon in tumor of the pituitary body, the passage of enormous quantities of sugar in the urine. He suggested that inasmuch as diabetes is a very common complication, eye symptoms may manifest themselves which possibly are due as much to the diabetes as to the tumor. In the case he mentioned there was a mature cataract in each eye, probably due to the diabetes and not to the acromegaly. Light perception was completely gone in one eye, and only the outer portion of one field was left. Dr. Snyder pointed out that according to the textbooks it seems easy to diagnose tumor of the chiasm and tell whether it is pressing on the nasal or temporal portion. A tumor pressing so as to produce a heteronymous diplopia seems impossible of explanation. Pressing on the nasal portion of the chiasm should produce bitemporal hemianopsia, or if we have a tumor cutting off one nerve lower down it should produce complete blindness. He asked Dr. Wood for his theory as to the production of heteronymous blindness.

Dr. Frank Allport has under his care three cases of acromegaly occurring in children. They are semi-idiotic, and it is impossible to examine their eye fields because of their nervousness and restlessness. The first child seen is a girl. The second is a boy whose mother was a sister of the father of the first patient. The third patient, also a boy, was related to the first

child. His mother was a sister of the mother of the first patient, so that there was no family relationship between the two boys. All three patients had congenital cataracts.

Dr. Casey A. Wood, in closing, stated that he did not believe that any one but an expert should attempt to interpret a skia-graph, even though the changes shown may appear to be very definite. It is the duty of the radiographer to give his opinion in the case, and being an expert in such matters, his opinion ought to be relied on. In Dr. Wood's case the radiographer, Dr. Retchmann, gave it as his opinion that there was an enlargement of the sella turcica, and evidence of tumor of the pituitary body. So far as operation is concerned, Dr. Wood could not see how a mere opening of the skull could do any good, except to relieve pressure; nor does he believe it to be rational to do a spinal puncture or to open the skull and go into the brain tissue. Of course, successful operations have been done on the pituitary body, but thus far only by Sir Victor Horsley of England, but so far the efficacy of an operation is still questionable. Dr. Wood did not agree with Dr. Snydacker as to the difficulty of understanding binasal and bitemporal hemianopsia if one considers the course of the optic fibres, but he does think that the imagination must be called on to suppose that a tumor does press on something. There must be and probably is an actual destruction of nerve fibers supplied to different parts of the globe, but one must imagine not only destruction of these particular fibers, but of the fibers that are supplied to other parts. In Dr. Wood's case there is a beginning atrophy of the whole nerve and he gave it as his belief that the woman will eventually become totally blind.

Case of Almost Complete Iridodialysis.

Dr. E. F. Snydacker reported the case of a man who in stooping suddenly struck his right eye on the back of a chair. Immediately his sight was gone and vision did not return. He suffered great pain. When seen three or four weeks after the accident, it was evident that there had been a rupture of the chorioid. There was a large scar 3 to 4 millimeters above the limbus. The iris was completely torn away above, and had settled in the lower portion of the eyeball. The pupil was a

small black spot. The anterior chamber was very deep. The lens evidently had been dislocated or had come out of eye entirely, or it may have been subconjunctival or down in the vitreous. The iris is tremulous, showing that the lens is gone. At first the eyeball was very soft; now it is very hard. According to one theory, when the cornea receives a blow, the lateral diameter of the eye is suddenly increased. The iris cannot accommodate itself to this increase and the pectinate muscle is torn from its attachment. Another explanation, and in Dr. Snodacker's opinion the better one, is that when the eye is struck violently, the aqueous is forced backward and the weaker portion of the iris is the most likely to yield, and an iridodialysis results.

Dr. Snodacker also mentioned briefly a litter which he has designed to carry patients from the operating table without disturbing them.

Congenital Coloboma of Upper Eyelid.

• Dr. W. O. Nance exhibited a nine months old girl, of Danish parentage, exceedingly well nourished and well developed, except for a unilateral coloboma of the upper left eyelid. The fissure was situated near the median line of the lid, somewhat to the nasal side. There was no other malformation present in the child. Ophthalmoscopic examination was negative, except that the eye was hyperopic to the extent of three or four diopters.

Sarcoma of Chorioid.

Dr. W. E. Gamble reported the case of a man who complained of failing sight and flashes of light, becoming more frequent and more constant. The personal and family history were negative. The eye was normal externally. The ophthalmoscopic examination revealed a detached retina on the temporal side, extending from the region of the disk forward almost to the ora serrata, cystlike in appearance. Only with great difficulty could there be detected any movement of the retina in changing the position of the head. Tension was minus. Transillumination was negative, but a diagnosis of suspected sarcoma of the chorioid was made. Later the patient had violent

pain in the eye; the pupil was widely dilated, and there was present superficial venous congestion, with a plus one tension. The eye was removed and the tumor proved to be a round cell sarcoma of the choroid. Dr. Gamble emphasized the fact that in intraocular tumors during the first stage the tension may be minus.

Discussion.—Dr. Casey A. Wood thought that the diagnosis of intraocular tumor is not so easy as is stated in textbooks, as is shown by Dr. Gamble's case. A man with a good personal and family history shows a distinct minus tension without any localized injection or other evidence of tumor, but, he continued, the microscopic section explains the practical impossibility of making the diagnosis. The character of it, the implication of follicular tissues, the commencement in the posterior part of the eye, and its small size explain it all. These tumors have been called crypto-tumors. They are associated with exudate in the vitreous so that even when it is possible to examine the tumor closely, a definite diagnosis can not be made, as in this case. Dr. Wood would call this a crypto-sarcoma. He suggested that skiagraphers develop their technique so that they can distinguish between solid tumors and exudates, which would furnish a means of diagnosis in these cases. Dr. Wood has failed in a large number of these cases to make a diagnosis. It is very puzzling when the tumor is covered with exudate, with the usual clinical signs absent.

Dr. W. H. Peck referred to a case of melanosa sarcoma with minus tension that he exhibited last spring. He removed the eye six weeks ago. The tumor has assumed large proportions. Transillumination also failed in this case to make a diagnosis. Dr. Peck stated that differentiation of tumors from exudates by means of the X-ray would be rather difficult on account of the ethmoid bones which offered so great an obstacle to the ray that any fleshy tumor would not be visible in the skiagraph.

Dr. Geo. F. Suker has found it advantageous in using transillumination to have the room dark and to use a little tube like opticians use, and an electro-ophthalmoscope, and have the transilluminator posteriorly. It makes considerable difference and one gets a better view and is better able to differentiate between tumor and exudate. It gives a perspective not ob-

tained otherwise. As to the skiagraph, he believes that the only thing to do is to take a stereoscopic view, taking pictures from different sides.

Dr. Wood suggested that the position of the tumor might make it impossible to use transillumination, although it would not be of much service in masses situated behind the equator of the globe. It is only those obstructions existing in the anterior portion of the eye that can furnish any evidence of their existence. When they occur in the neighborhood of the nerve head, not much evidence can be expected from any kind of transillumination.

Ocular Paralysis.

Dr. H. B. Young, Burlington, Ia., reported a case of ocular paralysis following a football accident. Following a blow on the eye from another man's head, the force of the blow impinging on the malar bone, the boy became unconscious and after arriving home he vomited. There was much swelling and ecchymosis, but the physician in attendance did not find any evidence of fracture of the bone. When the eye was opened the following morning, the boy found he had diplopia. The condition has changed but little since then. The swelling has quieted down, and in the median horizontal plane there is no diplopia, but only on looking up or down. There is a manifest lack of upward and downward motion; the muscles affected are evidently the superior and inferior recti. It undoubtedly was not a case of intracranial injury, because then the whole third nerve would have been involved, with ptosis, divergent squint and dilated pupil, but lateral motion is perfect.

Discussion.—Dr. Brown Pusey stated that he had seen paralysis of inferior and superior rectus in both eyes.

Dr. Thos. Faith has seen three cases in which there was paralysis of the internus, superior and inferior recti muscles, leaving both obliques intact and accommodation normal. These cases were not of traumatic origin. Dr. Patrick thought that the location of the nuclei of the individual fibers of the nerves were so distributed along the floor of the fourth ventricle that only two or three roots could be involved and the others remained free.

Optic Neuritis of Intraocular Origin. Dr. Henry Gradle.

The paper referred to the pathogenesis of one-sided optic neuritis due to the extension of chorioidal inflammation, dwelling especially upon that form which the writer had previously described as transient circumscribed central chorio-retinitis. The lesion is a single chorioiditic patch more or less centrally located, of variable size, ending in partial chorioidal atrophy, and leaving ultimately a circumscribed scotoma. There are always some vitreous opacities and deposits on Descemet's membrane during the active period of the disease, which is very often accompanied by optic neuritis. When the chorioidal patch is very small, and especially when such a small patch is located close to the edge of the disk, the optic neuritis may appear at first to be the primary disease. But on observing vitreous opacity, deposits on Descemet's membrane, and ultimately the pigmentary changes in the chorioid, it becomes evident that the neuritis is but secondary to the chorioidal inflammation. This form of chorioiditis is presumably due to the entrance of infectious material into a posterior ciliary artery. Treatment by salicylates and iodide did not seem to influence the course of the disease, while cathartic doses of calomel were apparently of benefit. The writer also called attention to the occurrence of optic neuritis in the course of other forms of chorioiditis.

MORTIMER FRANK, *Secy.*

COLORADO OPHTHALMOLOGICAL SOCIETY.

Meeting of Oct. 19, 1907, in Denver. Dr. D. H. Coover, presiding.

Syphilitic Optic Atrophy.

Dr. W. C. Bane presented a case of typical double optic atrophy, following infection 18 years before. R. V. = hand movements, L. V. = 5/30; although the recorded vision of each eye was normal two years previous.

Dionin in Traumatic Cataract.

Dr. Coover re-exhibited the case of dislocated opaque lens shown by him before the April 1907 meeting of the Society. 4% to 6% dionin had been instilled into the eye daily for nearly four months, and 10% daily for the succeeding two months. The lens was largely absorbed, and V. = 20/200 cum plus 10. D. sph. No portion of the lens and capsule remained.

Complete Albinism.

Dr. G. F. Libby showed a girl of 3 years, 8 months, with pink skin, white hair on scalp, brows and lids, and absence of pigment in iris and chorioid. There was high astigmatism, lateral nystagmus, photophobia and low alternating convergent squint. The child was bright mentally, well developed, and the only albino in four generations, at least.

Discussion.—Dr. Jackson said that incomplete albinism often improved as the child developed, but that when complete, there was no development of pigment. He had usually seen marked errors of refraction in albinos.

Dr. Marbourgh called attention to the entire edge of each lens showing through the thin irides, and advised the use of smoked glasses.

Dr. Neeper would have smoked glasses used from birth in these cases.

Dr. Black noted convergent squint of 2 or 3 mm., advised

measuring the refraction, and would prescribe the correction required in toric amber lenses. Dr. Coover advised amethyst lenses.

Supraorbital Malformation.

Dr. Melville Black presented a child aged $2\frac{1}{2}$ years, born at natural term, face presentation. At birth the forehead and region of the eyes had been much discolored and swollen, presumably from resting on the pelvic bones, and the child had no eyelashes or eyebrows. He called attention to the almost complete absence of frontal prominences which accentuated the apparent protuberance of the forehead higher up; also to the ptosis, epicanthus, short lateral diameters of the palpebral apertures, and almost complete absence of eyebrows and eyelashes. By throwing the head back, a palpebral opening of $\frac{3}{8}$ inch was shown. The question was raised whether immediate operative measures should be resorted to, or should there be delay until nature had done as much as she could toward restoring the contour of the bony parts of the supraorbital region.

Ruptured Globe; Phthisis Bulbi.

An eight year old boy who had been injured July fourth last, was shown by Dr. Black. The boy had touched off a loaded lead pipe which flew up striking the bridge of the nose and the left eye. The nasal bridge was crushed in, and the left eyeball ruptured, the rupture extending from 4 mm. above, to 2 mm. below the cornea. The lens and a large amount of vitreous had escaped. The eye was shrunken to about $\frac{1}{2}$ normal size, free from injection, and the upper lid could be only slightly opened from lack of bulbar support. Dr. Black had not removed the eye because he hoped that the globe might remain sufficiently large to promote development of the right orbit, but stated that he considered further waiting of questionable value. He raised the question of the influence of this shrunken globe upon orbital development, and the expediency of its removal and the substitution of an artificial eye.

Discussion.—Dr. Chase had repeatedly seen children wearing an artificial eye show equal facial development.

Dr. Nepper had success in two cases where shell eyes were

COLORADO OPHTHALMOLOGICAL

worn over old stumps, about one third posed in each case.

Dr. Strader reported the successful use of prostheses to replace the cornea.

In discussing Dr. Black's first case, complete congenital ptosis and ophthalmia neonatorum; and a second case showing congenital cataract and contraction of the palpebral commissure. Two brothers and father showed the same condition.

Posterior Scleritis

Doctors Stevens and Coover exhibited a case of posterior scleritis. The patient was a man of occupation that of boiler maker. Nine years ago he had been enucleated for an injury caused by a penetrating the eye ball. In December, 1901, syphilis, the remaining eye became inflamed. Later, while on a fishing vessel, and he was treated for the iritis until the vessel returned. The onset of the eye trouble. He was seen by a practitioner until May 15, when the patient was admitted to the Coover County Hospital. At this time the patient had no perception. The eyeball was reddened and seemed everywhere adherent to an opaque membrane. The outer and inner quadrant was covered by a white membrane. On rotating the eyeball upward and downward, ectasias of the sclera were partially visible.

Transillumination showed these scleritis translucent.

The tension was about plus 1.

Under ether, iridectomy was performed. The membrane removed by curettement. The relief followed and in about ten days the patient left the hospital white and quiet.

Mercurial inunctions were employed. The patient was in the hospital, and potassium iodide increased doses. No improvement in vision of sight being due to the numerous scleritis in the anterior half of the eye-ball.

Unusual Corneal Traumatism.

Dr. E. R. Neepor reported severe keratitis resulting from abrasion of the cornea from a whisk brush used by a boot-black in brushing a customer's clothes; and Dr. Libby, a mild keratitis caused by abrasion from bristles of a tooth brush, which slipped as the patient was brushing his teeth.

Foreign Bodies in the Cornea.

Dr. G. H. Strader reported three unusual cases of this character: (1) A patient had presented himself with, apparently, a foreign body in the cornea, just below the pupil. Efforts at removal proving fruitless and the magnet test being negative as to iron, the diagnosis of rust-stain was made. Later this staining increased, raising the question of the presence of an oxidizing metallic substance.

Discussion.—Dr. Jackson suggested that the cornea might still contain a non-magnetic alloy of steel, which should be searched for.

(2) Patient reported that a physician had removed steel from his cornea. Later there developed cataract, discolored iris and slightly raised tension. Sodium salicylate, grains 150 in ten hours, was given, followed by relief from pain and tenderness. Recurring pain was relieved by withdrawal of pus from the nose, by suction. An abscess was found at the root of an extracted tooth.

(3) Fragment of iron removed from cornea two days after its lodgement.

A dendritic ulcer formed two days later, with hypopion and stippled cornea. K. I. was ineffective, but subconjunctival injections of 1. 2000 oxycyanide of mercury was followed by clearing of the hypopion. Pannus, interstitial opacities and disciform keratitis developed with calcareous central deposit which did not disappear with curetting.

Treatment by yellow oxide ointment and heat was in progress.

Discussion.—Dr. Marbourg stated that iodine vasogen, with K. I., had helped a similar case in his practice.

Dr. Coover had touched undermined margins of similar ulcers with saturated potassium chlorate solution, and given cod liver oil, with resulting recovery.

Foreign Bodies in the Globe

Dr. A. C. Magruder reported lacerated wound of eye caused by the butt of a falling corn stalk. The anterior chamber soon filled with pus, for which irrigation was no help. Enucleation in two weeks, when the vitreous was found full of pus.

Dr. Libby reported a case in which a chip of steel had nicked the lid, passed through the sclero-corneal junction and periphery of the iris, and lodged in the vitreous. On first examination, the day following the injury, the cornea was steamy and conjunctiva edematous, and pain evidently severe.

The steel was at once extracted through an incision below the external rectus, by aid of a magnet. The eye looked worse on the following day, and pus appeared in the anterior chamber. The conjunctival sac was filled with iodoform powder, to no purpose. Five days after the accident, enucleation became necessary. A rope of pus was found extending from the corneal wound through lens and vitreous.

Dr. Jackson reported (1) an old case of suppurative hyalitis following foreign body in the vitreous, necessitating enucleation. (2) Eye injured last February. In July, trials by the giant magnet on five different days demonstrated iron within the eye. X-rays showed a foreign body present. Failing to get the metal on the Johnson magnet point, Dr. Jackson attached scissors to the magnet, cut through an encapsulating exudate, and removed the steel on point of scissors. In three days the patient was comfortable, in ten days vision rose from 2/100 to 4/9 partly.

Dr. Stevens reported two cases of steel in the vitreous in which enucleation showed the vitreous disorganized and filled with pus in 48 hours; and a third in which the eye was saved by removal of steel from vitreous.

Dr. Coover reported three pieces of copper shown in an eye, by X-rays.

Discussion.—Dr. Black considered penetrating wounds less liable to infection than contused injuries.

Dr. Walker would take chances on sympathetic inflammation for a time, in suppurative hyalitis. If the foreign body penetrated the lens, he would remove the lens, establish drainage, and endeavor to save the injured globe.

Meeting of Nov. 16, 1907, in Denver. Dr. Edward Jackson, presiding.

Symposium on Blood Pressure and Arterio-Sclerosis.

Dr. Edward C. Hill read a paper on the "Etiologic Importance of the Alimentary Canal in Relation to Vascular Pressure," indicating five general ways in which alimentary disorders may affect blood pressure, namely: autointoxication; infection and inflammation; pressure, and obstruction; reflex inhibition of function and malnutrition. He said that self-poisoning from the stomach and bowels ranked first in frequency and importance, and had found that nearly all his cases showing marked indicanuria had subnormal vascular tension.

Dr. Hill stated that all toxic substances absorbed from the alimentary canal exerted a sclerogenic action upon the blood vessels, which might lead eventually to arterio-sclerosis and high blood pressure. In fevers there was rise of tension at first, lowering later. One of the lowest (64 mm.) readings which he had encountered was associated with extreme chronic gaseous distension of the bowels.

Malnutrition obviously leads to subnormal blood pressure. In the great majority of chronic pathologic conditions of the alimentary tract, neurasthenic vascular hypotension was present; and with correction of such morbid states vasomotor tone would rise.

In an address on the association between Chronic Nephritis and Increased Vascular Pressure. Dr. James R. Arneill mentioned the intimate relation between the heart, arteries and kidneys, and the importance of using a sphygmomanometer with a standard (12 cm.) cup in taking blood pressure. Physicians marvelled that men with hard, pipe-stem arteries lived to be ninety or one hundred, until the blood pressure was studied and found low in these cases. On the other hand, apoplexy associated with no sclerosis appreciable to palpation caused surprise until similar study revealed high tension. In epilepsy low pressure was found. Apoplexy with high tension indicated uremia.

Dr. Arneill thought Janeway had given the best explanation

of high pressure in chronic interstitial to hardening of the media and intima; and said that authority suspends in high (180—200 mm. plus) reliance on it, especially with attendant urinalysis.

In chronic parenchymatous nephritis, high, in acute nephritis slightly raised, in disease and cyclic albuminuria. Hypertension, was an early stage benefit in chronic parenchymatous and check the pressure may below. Even 180 indicating weakening heart. Not to be treated.

Under treatment, Dr. Arneil suggests low purin diet, lessened purins, baths, and possibly small doses of thyroid extract; digitalis as an adjuvant, and glycerin in emergencies.

Dr. George A. Moleen, in a paper "Arterio-Sclerosis and its Tendency to What Extent", described two forms, the diffuse and the nodular. Uniform thickening, diminished elasticity, diminished lumen of the vessels, high pressure; while irregularly distributed effects. When the vessels were deformed as a result of external fibrosis, aneurysm expected, whereas patches of thick coat would seem more likely to cause either variety might exist in all patients with appreciable disturbing symptoms.

Dr. Moleen stated that increased blood pressure was accompanied, and was thought to cause normal systolic pressure averaging 125, diminished calibre of the vessels caused by metabolism.

Diffuse and nodular arterio-sclerosis, with opposing tendencies quite opposed to each other in cerebral arteries, which were above

one form as the other. Nodular fibrosis seemed to affect the aorta preferably, causing aneurism; while diffuse sclerosis of the renal capillaries was related to chronic interstitial nephritis, with its high tension.

In conclusion Dr. Moleen said that the general effects of arterio-sclerosis were vascular and visceral. In the former they consisted in loss of arterial elasticity, deformity, tortuosity, obliteration, aneurism, thrombosis, high arterial tension and rupture. In the latter they occur in the heart, brain, kidneys and other organs.

"Ocular Effects of Alimentary, Renal and Cardio-Vascular Disease" was the subject of a paper by Dr. E. W. Stevens, who said that disorders of the alimentary tract played an important role in ocular pathology.

Phlyctenular disease of the conjunctiva and cornea was closely associated with disorders of nutrition; while subconjunctival and retinal hemorrhages might be produced by straining at stool. Most ocular inflammations, as acute and chronic catarrhal conjunctivitis, were improved by cathartics. On the other hand prolonged gastro-intestinal catarrh in infants might lead to corneal ulceration from impaired nutrition. It was highly probable that many diseases of the uveal tract were due to intestinal autointoxication. In the absence of other evidence of infection in these cases the alimentary tract should be suspected, and calomel and intestinal antiseptics administered. Errors of diet and intestinal fermentation or putrefaction might be an important factor in producing ocular lesions by bringing about arterio-sclerosis, the first signs of which might be revealed by the ophthalmoscope.

Dr. Stevens called attention to edema of the lids, especially temporary swelling of the lower lids, as one of the earliest forerunners of parenchymatous nephritis, often accompanied by anasarca. One of the most striking symptoms of renal disease was uremic blindness; usually sudden, bilateral and complete, and with restoration of vision in 12 to 24 hours, up to a week. This blindness was most common in acute nephritis, as in scarlet fever, pregnancy and after exposure to cold.

The most common ocular manifestations of renal disease were retinitis and neuro-retinitis, most frequently met in chronic

Bright's disease, but not common in chronic parenchymatous nephritis and albuminuria of pregnancy. The nerve head was variously affected, from hyperemia to "choked disk". The retinal lesions included edema, whitish degenerative patches about the macula, hemorrhages and exudates. Of even greater importance were the changes in the contour, size and general character of the retinal vessels.

It was stated that changes in the capillary circulation, and in the smallest retinal arteries and veins, combined with high arterial tension, were noticeable before albuminuria or other sign of real disease became manifest. On the other hand some cases of nephritis presented no retinal changes. Groenouw's statistics of 22.4% of retinal lesions in 935 cases of nephritis probably represented fairly well the proportionate involvement of the retina. Statistics of many hundred cases showed that a large majority presenting retinal lesions died within a year after the retinal manifestations were discovered, excepting only the exanthemata and albuminuria of pregnancy.

As to ocular effects of cardio-vascular disease Dr. Stevens mentioned aortic regurgitation as frequently causing pulsations of the retinal arteries, cordiac dilatation causing tortuosity of retinal veins, endocarditis, sometimes causing embolism of central artery of retina, aneurism of aorta or innominate artery giving rise, at times, to embolism of central retinal artery, dilatation of the pupil and widening of the palpebral fissure.

Palsies of the external ocular muscles might occur from aneurism of the internal carotid, and pulsating exophthalmos, if rupture into the cavernous sinus occurred.

In the eye, vascular changes were displayed with a clearness and minuteness nowhere else obtainable in life, and indicated the general state of the bloodvessels. Gunn had reported fourteen cases of intraocular vascular disease in which cerebral hemorrhage subsequently occurred. Yet, it must be admitted, angiosclerotic processes were generally very irregular in distribution. It was evident that disease of the retinal vessels was not positive proof of disease in any other vascular area, or that absence of retinal changes proved healthy arteries elsewhere. The retinal vessels might also be diseased without ophthalmoscopic evidence.

But with these reservations the ophthalmoscope still remained the best indicator of the state of the vessels generally. In all cases the evidence furnished by rigidity of the peripheral vessels, high arterial tension, cardiac hypertrophy, character of heart sounds, and the readings of the sphygmomanometer and sphygmograph, must have due weight.

The difficult diagnosis of the *early* stage might be made by noting a brick-dust color of the papilla, uneven calibre and undue tortuosity of the retinal arteries, increased distinctness of the central light streak, unusually light color of the breadth of the arteries, and alteration in the course and calibre of the veins. Middle-aged patients showing these signs should be recommended to thorough general examination. If the eye ground examination is thus confirmed suitable treatment might prevent or retard the development of arterio-sclerosis, with its disastrous consequences. When the fundus showed such positive changes in the size and breadth of the retinal arteries that a beaded appearance was produced; or perivasculitis in the form of white lines along the vessel walls; alternate contraction and dilatation of the veins, particularly indentation of the veins by the hardened arteries, they assumed a positive diagnostic importance not surpassed by the four important clinical symptoms of arterio-sclerosis.

Discussion.—Dr. O. M. Gilbert said that we were just realizing the importance of this enormous problem. Hypertension, which might be compensatory, and arterio-sclerosis, were not necessarily associated, but were, more often than generally believed. In the old, lack of cardiac force might preclude high pressure. He would save the patient's suffering from hypertension, by restriction of exercise, and by relieving the heart's action otherwise.

Dr. J. A. Patterson had observed dull retinal reflex and tortuous veins due to gastro-intestinal disturbance, improve as the digestion improved from withdrawal of offending articles of diet, as tea or coffee.

Dr. Bernard Oettinger stated that arterio-sclerosis might begin in any vascular coat, that its bad effects and tension were variable, and due to many causes. He believed metabolic changes and intoxication preceded arterio-sclerosis, and

had noticed far different effects from syphilitic arterio-sclerosis than from that with other causation. He would eliminate toxins, reduce purins and give iodine, which he had found efficacious.

Dr. C. E. Tennant believed in an organic or toxic cause for arterio-sclerosis, and said that the study of blood pressure revealed many surprises. He had seen pressure of 140 to 150 in a chronic beer-drinker in whom albuminuria twice appeared.

Dr. Edward Jackson stated that Dr. Moleen, like other observers, had noted the effects on the large trunks, which were in a different class from the retinal vessels. We would get more and earlier information from study of the smaller vessels. Recent statistics attributed high blood pressure to age, syphilis, excessive use of tobacco and, least of all, to alcohol.

Dr. Jackson reported albuminuric retinitis of first pregnancy at age of twenty-seven. There was severe uremia, much albuminuria, and premature delivery of a dead fetus, followed by blindness. After four months vision had returned to normal, there were no hemorrhages or white spots or chorioidal atrophy, but the chorioidal vessels were plainly visible. In a fundus known to have been normal before confinement, there was atrophy of the retinal pigment layer and massing of the pigment in specks, in the outer two thirds of the visible fundus, and the chorioidal vessels showed the yellowish white appearance indicative of sclerosis. There was no albuminuria or abnormal blood pressure at this time.

In closing discussion Dr. Hill said that irritation of adrenal glands and liberation of adrenalin into the circulation was the probable cause of high tension in chronic Bright's disease. He had found strophanthus good to lower the pressure, and aconite to slacken the circulation.

Dr. Moleen believed that increased tension and arterio-sclerosis preceded rather than followed chronic interstitial nephritis, and that albuminuria depended on constant and continued high pressure. He advocated iodine and rest as therapeutic means.

Dr. Arneill advocated digitalis rather than strophanthus. In case of doubt as to presence of hypertonia or arterio-sclerosis, he would give amly-nitrite to establish diagnosis. If

the blood pressure fell in ten minutes, he would consider no marked arterio-sclerosis present, but hypertonia, which was likely to be helped by treatment. Increased blood pressure and arterio-sclerosis might be separate or combined. Heredity had a marked effect, sometimes developing these changes at thirty years. He believed the good effect of iodine was due to its alterative action on other parts of the body.

Dr. Stevens related a case, previously reported, of retinal hemorrhage. He had later passed successfully a life insurance examination, but died one year later from apoplexy. He had examined twenty-four men ranging from 78 to 100 years, finding arterial fibrosis, but no increase of blood pressure. He usually had found arterio-sclerosis unaccompanied by increased tension, and with sclerosis and high pressure had often found no albuminuria. He emphasized the need of *following up* the cases of arterio-sclerosis, carefully noting changes of calibre and tortuosity of the vessels.

Keratitis Profunda.

Dr. Melville Black presented Mrs. T., aged 58, first seen 12 years before. Three weeks earlier she had noticed a dimness of vision of the left eye, which gradually increased. There was complaint of pain and an inflamed eye. When Dr. Black first saw her the left eye was inflamed and photophobic, and the cornea had the appearance of ground glass. Tension normal. Vision = fingers at 2 feet. Atropin, hot applications and galvanism were used locally, and iodide of potassium internally. The cornea cleared in about two months and a half, with resulting vision of 20/40. The present attack had begun about two and a half months previous. Dr. Black saw her about seven weeks later, and found the left eye in the same condition as when first seen, 12 years before. He prescribed atropin 4 times daily and 5% dionin salve at bed time. He saw her two weeks later and found the pupil well dilated and the cornea very much more transparent.

When shown before the Society the cornea showed some loss of transparency and a general thickened appearance.

GEORGE F. LIBBY, *Secretary*.

ST. LOUIS MEDICAL SOCIETY

THE OPTHALMIC SECTION

Meeting of May 8, 1907. Dr. Barclay

PRESENTATION OF PATIENTS.

Glaucoma Secondary to Injury: Dr. Buckwalter: A man, 23 years old, came under observation in 1906, with the following history: On May 1, 1906, he sustained an almost central perforating injury by the bursting of a water-glass. At first he was sufficiently blind to enable him to observe large objects, but this grew worse, and the eye became "bloated." It showed the eyeball uniformly enlarged, with marked injection; a large, almost central leucocyst, adherent iris, and pupil widely dilated. He was unable to move his hand at six inches. Treatment consisted of potassium iodide and mercury internally, and pilocarpine and eserine. The pupil contracted, became lower, and the congestion diminished. In May the patient returned to work. May 15, 1907, with all the previous signs greatly excepted, completely abolished. It is worthy of note that he has never had any pain in the eye, or of any kind, except a momentary twinge in the right eye.

Exophthalmos, with Paresis of Extremities: Dr. Buckwalter: Female, 63 years of age, came under observation a year ago. The complaints were of increasing diplopia, drooping of the upper lid, and weakness of the limbs. As the symptoms cleared up and she passed from the hospital a few weeks ago, she again consulted me, at which time I diagnosed moderate exophthalmos and slight convergent strabismus. With her glasses she reads 20/20. Urine negative. Ophthalmoscopic examination

Case of Cataract and Chorioidal Coloboma(?). Dr. J. E. Jennings: This young man, when a boy of five was struck in the right eye, sustaining injury of the iris and lens. We see now as the result, a slight circumscribed opacity of the lens. With the ophthalmoscope we find peripherally a large patch of what appears to be a coloboma. Just what connection this wound of the lens has with the coloboma it is difficult to say. It may be due to the injury, but if so is unusual, considering the transparency of the lens.

PAPER. *Dressings after Intra-ocular operations*: Dr. C. Barck.

While the roller bandage, introduced by Graefe, remained the standard dressing for nearly half a century, within the last twenty years a number of new methods have been recommended and tried. These can be classified under three categories, which the author terms the "strip," the "free," and the "open" methods, respectively. In the first, the lids are covered with a strip of isinglass plaster only; in the second, the lids are free, but the eye is protected from injury by some kind of a shield or mask; in the third, the eye is left open without any protection whatever. The paper discusses at length the advantages and disadvantages of the bandage, and of the three new methods, and arrives at the following conclusions: The idea of restricting the motions of the eye by the bandage is erroneous; this rather interferes with the quick and regular closure of the wound. A gentle closure of the lids is beneficial; it does not, as maintained by some, interfere with the regular flow of the tears, and increase thereby the danger of secondary infection. Furthermore, protection of the operated organ against gross insults is a surgical demand. The author, therefore, rejects the bandage, (with exceptions, of course), and rejects the strip and the open methods. For final selection, he discusses the free method (as practiced now frequently in Europe), and a combination of the free and strip methods, and finally decides in favor of the latter. "The lids are covered with a thin layer of gauze and cotton, or cotton alone, which is held by a strip of adhesive plaster running from the forehead to the cheek. Over this is placed a shield, which is held by a strip running from the nose to the temple. At the dressings, only the upper parts of the plaster are detached and are afterward reapplied." As a shield,

he prefers an aluminum shield, as she mask.

Discussion.—Dr. Buckwalter stated rations he smears sterilized vaseline o a piece of sterilized gauze, over this a p ters the cotton down with collodion.

Dr. Williamson spoke of the advan mask of Fuchs, which covers both eyes the cheek and nose, thus offering a the post-operative treatment than t Dr. Barck.

Dr. Alt stated that he does not us ribbon to one hand of the patient, pa and tying it to the other hand, so that to raise the hands to the eye inevitat

Dr. Saxl discussed various methods the clinics of Vienna, Württemberg, Zi

Dr. Green called attention to the mask, dwelling especially on the possibl contour of the patient's face, and to t across the forehead, holding it more :

PAPER. "*Notes on the Bacteriolo flammations.*" Dr. W. H. Luedde.

The writer emphasizes the desirabili lar examinations to determine the ba ent in the various types of inflammat junctiva and cornea. Reference was n at the Fondation Ophthalmologique. Tables presented showed the Weeks' ba out of 226 cases diagnosticated as a only three times in 265 cases of "chro

The diplobacillus of Morax-Axenfe times in 226 "acute"; but 102 times "Chronic" cases examined at Paris.

In a smaller number of examination private practice, the Bacillus of Week the acute cases, and not found at all in Diplobacillus of Morax-Axenfeld was fo and 30% of the chronic cases. The v

of "smears", easily and rapidly made, was insisted on as being a thing very much worth while, even for the busy practitioner.

Meeting of June 12, 1907. The Chairman, Dr. Barck, presiding.

A Case of Migrating Keratitis. Dr. J. Ellis Jennings.

This patient is 23 years of age with evidences of congenital syphilis, Hutchinson's teeth, etc. In 1897 at the age of 13 she developed an interstitial keratitis in the left eye which slowly cleared. Final V=5/6. Right eye V=5/4. In January, 1906, she developed a serous iridocyclitis in the left eye which reduced vision to 5/40. This eye still flushes up on the slightest provocation. On February 1, 1907, she complained that the vision of the right eye was failing, V=5/40. Examination showed an infiltration in the deeper layers of the cornea consisting of several opaque dots surrounded by a hazy area, with absolutely no signs of inflammation, pericorneal injection or bloodvessels in the cornea. The opacity started at the nasal side of the pupil and has gradually crossed to the temporal side, so that vision which was reduced to 5/40 is now 5/6, the opacity taking four months in transit.

Discussion.—Dr. Alt stated that the case seemed to him particularly remarkable on account of the long interval between the affection of the one eye and that of the other.

Dr. Barck believed the case to be a keratitis due to hereditary syphilis, and stated that the affection in the second eye was apt to pursue a milder course than that in the first, on account of the specific treatment which had been given at the time the first eye was affected.

Dr. Jennings stated that the peculiarity in the case consisted in the migration of the opacity across the cornea without inflammatory signs. Treatment had been confined to the use of dionin daily.

Rupture of Descemet's Membrane from High Intra-ocular Pressure. Dr. A. Alt.

Fissures in Descemet's membrane have been found especially in buphthalmus, high grade myopia and glioma retinae. Some observers appear to have encountered these fissures frequently, and others not at all. The author believes that high pressure

alone cannot be held responsible, but as the softer tissue of the child (in exan and disturbances in the nutrition of t be held accountable.

Recently in a case of glioma, the autographed and contoured grey lines running in the depth of the cornea concentrically with the corneal periphery. The distance from the temporal, the other 3 mm. from the nasal. The sections showed the ruptured ends of Descemet's membrane to run up spirally toward the cornea or protrude into the anterior chamber. The close packing of the lamellae and their straightened appearance after the time the ruptures occurred the cornea was of normal extent. That the ruptures were not caused by the fact that the ruptured ends were not in contact with the endothelium, and that a new Descemet's membrane had formed a gap between the ends, which were all covered by endothelium. Opposite these ruptures, where the cornea wanting for some distance, the cornea was covered with epithelium.

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NEWS AND NOTES.

The first Circular Announcement of the ELEVENTH INTERNATIONAL CONGRESS OF OPHTHALMOLOGY to be held in Naples from the 2nd to the 7th of April, 1909, has been received and reads as follows:

Honoured Sir and Colleague:

At the request of Professor Angelucci, to whose care the work of preparation for the coming reunion was confided at the last meeting of the X International Ophthalmological Congress, we have constituted ourselves into a Committee of Organization for the XI International Ophthalmological Congress, which meets at Naples in the spring of 1909.

Following an old-established and pleasing custom, and as some slight appreciation of their merit, we have conferred the honorary presidency on Professor Marc Dufour, president effective of the Congress of Lucerne, and the honorary Vice-presidency on Dr. Landolt, member of the Organizing Committee of that Congress.

From the programme elaborated by the preceding Congress and unanimously adopted by the members thereof, we have compiled the regulations for the XI International Meeting, a copy of which we have much pleasure in forwarding to you. As soon as the final preparations for the Congress are made we will send you all other necessary notices and circulars, also particulars with regard to the journey, and the means by which we hope to render even more pleasant the short stay of the members of the Congress among us.

We invite you, however, to inform us, either personally or by means of your country's corresponding members, of your presence at the Congress, and we sincerely hope that you will not fail to take an active part in the work of the reunion at Naples. This will also be an opportunity for you to enjoy the beauties, so justly celebrated, of this city.

Assuring you of the pleasure we shall have in offering you the most assiduous and cordial hospitality in our power

We remain — Yours faithfully

THE ORGANIZING COMMITTEE.

PROF. ANGELUCCI, *President*—*Members*: PROFESSORS:

ADDARIO — ALBERTOTTI — ALESSANDRO — BAJARDI — BAQUIS
— BARDELLI — BASSO — BIETTI — BOCCHI — BOSSALINO —
CERASO — CIRINCIONE — DE BERARDINIS — DE LIETO VOLLARO
— DESOGUS — FALCHI — FORTUNATI — FRANCAVIGLIA —
FRUGIUELE — GALLENGA — GATTI — GAUDENZI — GONELLA
— GUAITA — LODATO — MANFREDI — MAZZA — MONESI —
ORLANDINI — OVIO — PARISOTTI — PES — PETELLA — PUCCIONI
— RAIA — RAVA — REYMOND — ROSELLI — SANTUCCI —
SBORDONE — SCALINCI — SCCELLINGO — SCIMEMI — SIMI —
SGROSSO — TARTUFERI — TROMBETTA — VALENTI.

Corresponding members for United States of America:

DR. HERMANN KNAPP—*New York, 26 West 40th Street.*

DR. G. E. DE SCHWEINITZ—*Philadelphia, 1705 Walnut Street.*

REGULATIONS OF THE CONGRESS.

1. In conformity with the vote given at the last sitting of the Congress of Lucerne it has been decided to hold the XI International Ophthalmological Congress at Naples.

2. The reunion will last from the 2nd to the 7th of April 1909 with four morning sittings dedicated to discussion, and one afternoon sitting for demonstrations.

3. Those ophthalmologists subscribing to the Congress and wishing to communicate their work, must forward same together with their inscription between the 1st and 30th of September 1908. All works must be compiled in one of the official languages of the Congress; viz Italian, French, English, German and Spanish¹ and the length of every communication must not exceed 5 pages of the form of the paper used in the documents of the preceding congress.

4. The documents of the Congress will be compiled in three parts: The first part will be sent before the meeting to those who shall have signified their intention to be present and will contain the printing relating to the work of the Commission

nominated at the preceding Congress to refer to its official themes:

*1st To fix, with regard to an indemnity, the value of a lost or damaged eye;*²

2nd Unification of the measure of the visible force, and unification of the notation of the meridians of astigmatism. The second part, which will be forwarded shortly after, will contain the print of communications received in time and in the order of their date of reception. The third part of the documents which will be dispatched after the Congress, will contain the minutes of the discussions and the sittings of demonstration.

5. The reunions of the Congress will be limited to the discussions only of works already published in the documents. The minutes of the discussions will be edited from the resume presented by the author and from that of the secretaries of the sittings.

6. At the sitting of demonstration, apparatus, preparations, instruments, methods of operations and projections can be presented.

7. The Congress will proceed, at the first sitting, to the nomination of a definite office of presidency, which will have the direction of works and sittings, and will fix the orders for the days of sitting.

8. Any member having obtained permission from the President will be able to speak for not more than five minutes, nor more than once during the same sitting on the same argument, unless the Assembly, being consulted thereon decides otherwise.

9. The Congress votes by rising or sitting on the deliberations being put to the meeting.

10. To the Congress is annexed an exhibition of all kinds of oculistic objects ancient and modern, of which mention will be

(1) In this Congress the committee intends making the Spanish language also official, in view of the great increase of interest which has taken place in ophthalmology in Spain and in Latin America.

(2) Some members delegated to the Congress of Lucerne to treat on this subject, have expressed their intention to abstain from referring to it, holding an agreement, on such an argument, difficult especially on account of the diverse legislation which governs this matter in their respective Countries.

made in the third part of the Congress documents. The rules which will govern the exhibition will be indicated in a separate circular.

11. Tables necessary for works will be at the expense of the authors themselves.

12. The President of the Congress will definitely decide regarding any incident not foreseen in the present regulation.

13. The subscription for the Congress is francs 25 for members and 10 francs for every member of their family. Notification of presence, subscription and communications relative to the Congress should be addressed directly to Prof. Arnaldo Angelucci R. Clinica Oculistica in S. Andrea Delle Dame, Naples, or by means of the corresponding members of the relative Countries.

The members ticket which those taking part in the Congress will receive is strictly personal and available for no one else. The same will give free entrance to the Museums and to public monuments as well as obtain reductions from railways, and to other pleasures which will be indicated later.

The New York State Journal of Medicine, October 1907, announces that Mrs. William Ziegler has provided funds for the publishing of a magazine for the blind. It will contain news items, stories and special articles of interest to the blind, and will circulate in institutions as well as before the public. It will be the first magazine of its kind in America, and the second in the world.

The Graefe Prize instituted by Professor von Welz, has been awarded to Professor A. Birch-Hirschfeld, for his work pertaining to the action of the ultra-violet and the X-rays upon the eye.

Dr. J. Talko of Lublin, Russia, whose name has been for years familiar to ophthalmologists, has recently died at the age of sixty-eight years.

Dr. W. W. McClure, after a service of many years as Surgeon to the Wills Eye Hospital, Philadelphia, has resigned from the Staff, and has been succeeded by Dr. Paul J. Pontius, for some time an Assistant Surgeon to the Hospital.

Amplitude of Accommodation at Different Periods of Life— In the Annals of Ophthalmology for July, 1907, there is an article entitled: "The Amplitude of Accommodation at Different Periods of Life and Its Relation to Eyestrain," by Edward Jackson, M. D. The author writes of the work of such eminent authorities as Donders. Collins and Risley, confirms their views by extensive observation, and calls attention to other theories which were undoubtedly in print some time ago in medical journals, and, although not formally referred to by Dr. Jackson, seem now to be corroborated rather than evolved.

Dr. Jackson writes: "At the outset of special practice, nearly 25 years ago, I encountered a case of a healthy boy of 15 who had only 5 D. accommodation, and required 1.75 added to the correction of his hyperopic astigmatism, in order to do his work at school. Recently I have seen a boy of the same age who had but 3 D. of accommodation. Both of these patients had been subjected to the influence of atropin for several weeks in the hope of revealing hyperopia that was supposed to be latent, and they each had a long history of unrelieved eyestrain."

Although unrelieved loss of accommodation from atropin was observed by Dr. Jackson 25 years ago, it seems to be now in print for the first time, for it is unlike the case reported by him in 1886, (and now quoted by him) inasmuch as the patient steadily improved and was able to throw aside the glasses altogether.

In the New York Medical Journal (July 1900 p. 52) a case is given of a girl of nineteen who required for near work 1.50 D. added to the correction of her hyperopic astigmatism. The accommodation had been normal prior to protracted use of belladonna and wrong glasses. Patient was robust and pupils normal. See also, Medical Times, Feb. 1901, p. 57.

Dr. Jackson writes: "The age at which accommodation ceases or becomes inappreciable is seen to vary widely. In one case it had entirely disappeared at the age of forty-six; in the majority of cases it was present or reduced to 0.25 D. after sixty, but in one case there remained 1.50 D. at the age of sixty-eight years, which would seem to indicate that it may persist to the age of seventy-five or eighty."

In the Ophthalmic Record (Oct.
case of a woman sixty-eight years o
of 1.25 D.; a table and cases are giv
accommodation persists to the age of

NORBURNE B. JENKINS.



